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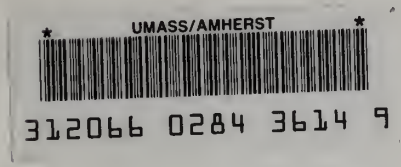

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ROUTE 37 TRAFFIC STUDY

Metropolitan Area
Planning Council
110 Tremont Street
Boston, MA 02108

812/358

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This project was a joint effort by the Metropolitan Area Planning Council and the Central Transportation Planning Staff.

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EXECUTIVE SUMMARY

The Route 37 Study represents an analysis of options available for addressing the concerns of residents living along the highway while also meeting traffic circulation needs. The study was undertaken by the Metropolitan Area Planning Council and the Central Transportation in cooperation with the Massachusetts Department of Public Works and elected officials and residents of Braintree and Holbrook.

The Massachusetts Department of Public Works at this time has agreed to a demonstration program restriping Route 37 from Union Street to the Holbrook Town Line to one lane in each direction. This demonstration will continue for several months to determine if this lane configuration can accommodate traffic volumes. MDPW will undertake traffic counts on Route 37 and adjacent streets to assess the impacts of the changes.

A report will be developed to document the demonstration project.

Route 37 in Braintree and Holbrook is an arterial roadway generally serving north-south traffic (Map 1). The section of Route 37 of concern in this study connects Plain Street in Braintree to Route 139 in Holbrook, as specified by the two communities.

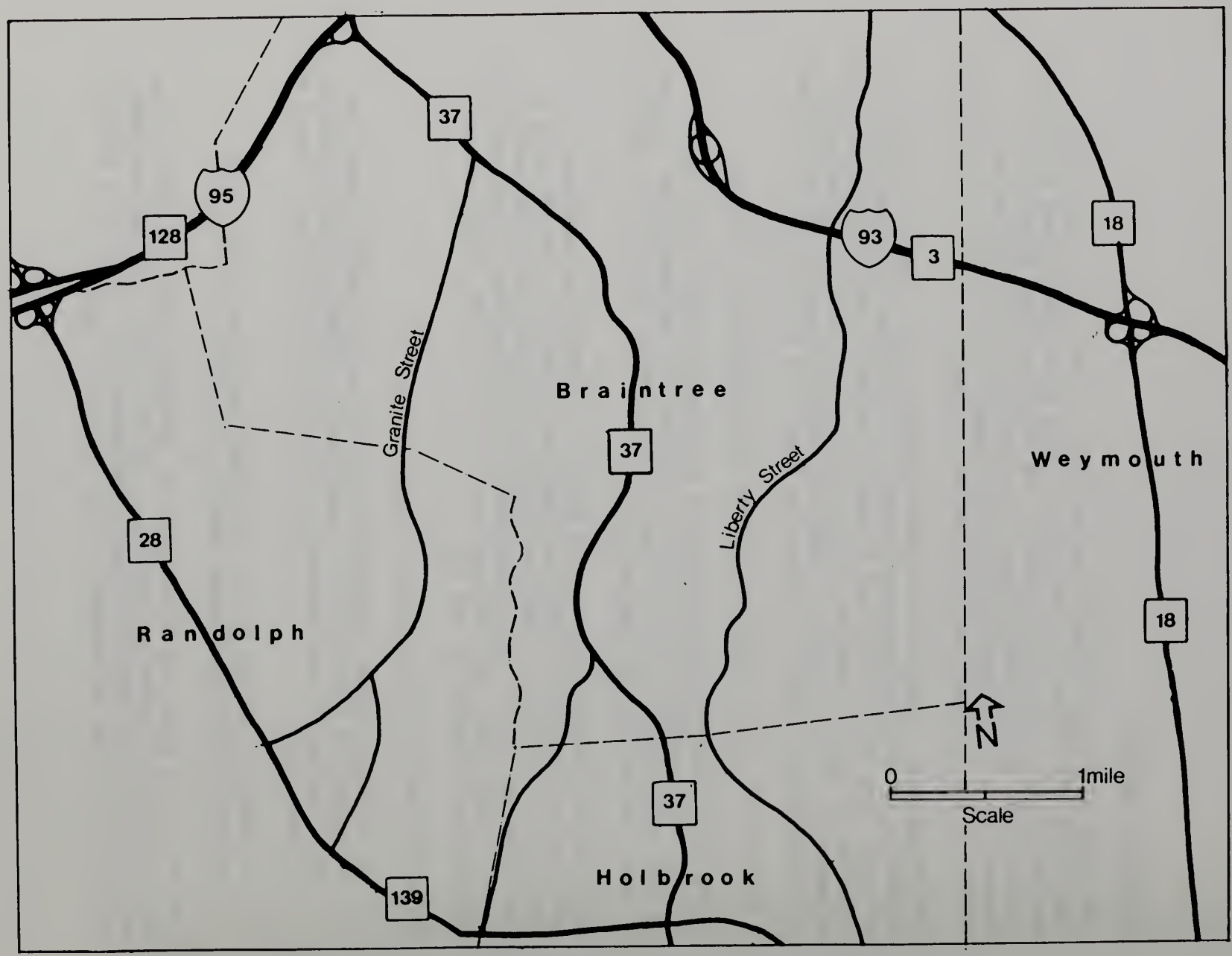
Residents and town officials along Route 37 in Braintree have been concerned with traffic safety and operations from Plain Street south to the center of Holbrook. Some feel that this roadway is too narrow for four lanes and that it should operate two or three lanes, the center lane used for left turns. In Holbrook there is concern over congestion at the intersection of Routes 37 and 139.

The objectives of this study have been:

1. To identify highway projects that would improve traffic operations and safety in this corridor, specifically addressing the concerns of local residents, and comparing scenarios with four lanes, 2 lanes and 3 lanes; and

2. To identify land use growth management techniques which could minimize future development impact on traffic.

A Route 37 Task Force was established to identify issues and alternatives and to review the technical analysis. The task force included residents, local officials and the Massachusetts Department of Public Works which is responsible for the maintenance of this section of Route 37.



Map 1. Route 37 in Relation to the Surrounding Road Network.

This study provides a discussion of the advantages and disadvantages associated with nine possible alternatives for addressing traffic and safety concerns raised by the task force:

- o No Change To Current Highway Conditions;
- o Widen Route 37 To Accommodate Four Lanes;
- o Restripe Route 37 To Two Lanes;
- o Restripe Route 37 To Three Lanes;
- o Bypass Highway;
- o Transportation Systems Management;
- o Narrow The Roadway And Reduce Lanes;
- o Divide Highway; and
- o Place Barriers Between Route 37 And Sidewalks

Six criteria, also identified by the task force, were used to determine the advantages and disadvantages of each alternative:

- o Capacity and Delay;
- o Safety;
- o Secondary Impacts;
- o Air Quality
- o Quality of Life; and
- o Feasibility.

The 1985 Braintree Master Plan conducted a full build-out for Braintree based upon existing and proposed zoning ordinances. This analysis studied the resultant impacts of full build-out on, among other things, traffic. The Master Plan identified a 0.6% growth in traffic along the portion of Route 37 considered in this project.

The Master Plan identifies more significant traffic growth along other streets bounding the study area such as Grove and Plain Streets (54.3%) and Hancock Street between Plain Street and Pearl Street (83.5%). Much of this traffic growth could be due to the development potential for land along Liberty Street such as the proposed 400 unit "Town Crossing" development.

For these reasons growth has not been considered to be a major determinative of operating conditions for this portion of Route 37.

The analysis of impacts of the alternatives are summarized below:

1. No Change to Current Highway Conditions

   If Route 37 were left as is, the roadway would operate with adequate capacity. However, unsafe conditions for pedestrians and vehicles attempting to enter or exit the traffic stream would continue. This may cause some to seek alternate, less direct, routes thus increasing air pollution emissions.

2. Widen Route 37 to Accommodate Four Lanes

A widened Route 37 would provide increased capacity in the corridor. However, widening would not necessarily address inherent safety problems in the corridor. Likewise, a widened highway could draw added traffic to Route 37, increasing congestion and vehicle emissions. A highway widening for Route 37 would require extensive land takings.

3. Restripe Route 37 to Two Lanes

A reduction to two lanes on Route 37 would result in a level of service "E/F" on the highway. This would mean a doubling of hydrocarbon and carbon monoxide emissions in the area (see Table 7).

A lane reduction would reduce peak hour vehicle speeds to less than 20 miles per hour. These conditions would tend to reduce speed related accidents but could increase other types of accidents, i.e. rear-end or angle accidents. A lane reduction would not address inherent roadway curvature problems.

4. Restripe Route 37 to Three Lanes

The use of a continuous two-way left-turn median lane is not appropriate in residential areas. This technique is effective in areas with a limited number of high volume driveways.

A three-lane cross-section would reduce available capacity; and the level of service would be nearly as low as a two-lane road (LOS "E/F"). Increased vehicle emissions would be a direct result.

The center lane could also lead to increased head-on conflicts.

5. Bypass Highway

A bypass highway could reduce traffic on Route 37, improving the level of service and reducing accidents. However, the outer-belt proposal would place additional traffic in an adjacent residential neighborhood and the inner-belt proposal would have a deleterious impact on wetland areas.

6. Transportation Systems Management

Transportation Systems Management (TSM) provides a number of options to be considered to address specific concerns along Route 37. These include capacity improvements (signal timing, additional signals, geometric changes) as well as safety improvements (pedestrian facilities, guard rails, access constraints).

TSM provides a combination of low cost, effective methods to address the dual role of the road as a local street and regional arterial facility.

7. Narrow the Roadway and Reduce Lanes

A reduction to two lanes on Route 37 would result in a level of service "E/F" on the highway. This would mean a doubling of hydrocarbon and carbon monoxide emissions in the area (see Table 7).

A lane reduction would reduce peak hour vehicle speeds to less than 20 miles per hour. These conditions would tend to reduce speed related accidents but could increase other types of accidents, i.e. rear-end or angle accidents. A lane reduction would not address inherent roadway curvature problems.

8. Divide Route 37 with Barriers

A raised median on Route 37 could be used to control and limit turning movements on the road. Such an action could improve capacity and safety in the corridor. The use of a raised median would have to allow for U-turns at some locations. Additional capacity improvements would be needed at these locations. Specific design considerations would need the agreement of the Federal Highway Administration.

9. Place Barriers Between Route 37 and Sidewalks

This alternative, raised by the Task Force, is a Transportation Systems Management Strategy and has been addressed above under the discussion of such strategies as an alternative.

The study recommends:

Intersection Signalization

1) Signalization of the intersections of Peach and South Streets on Route 37 to provide adequate gaps for vehicles to enter the flow of traffic.

2) Creation of a coordinated progressive traffic signal system along Route 37.

3) Optimization of signal timing (existing signals) at Plain Street, John's Avenue and Route 139 on Route 37.

Widening

1) Widening the intersection of Route 37 and Route 139 in Holbrook to two lanes on every approach.

2) MDPW study of the feasibility of widening Route 37 in Holbrook from the present two-lane to a four-lane configuration.

3) MDPW determine the advisability of restricting turning movements along Route 37 between South Street and Park Avenue through a) eliminating access points, b) turn restriction signage, c) one-way street pairs, or d) dividing Route 37 with a raised median.

Pedestrian Facilities

1) Sidewalks be constructed along both sides of Route 37.

2) MDPW should assess the need for pedestrian phases at all new or improved traffic signals along Route 37.

Transportation Alternatives

1) Promotional efforts should be undertaken by the MBTA, Braintree and Holbrook officials, local employers, and local businesses to increase the use of public transportation.

2) Local employers should be encouraged or required to increase employee ridesharing.

3) The MBTA should study the possibility of increasing bus service along Route 37. This study could include the possibility of increased feeder service along Route 37 to the Braintree Red Line Station.

Growth Management

1) Braintree and Holbrook should formulate growth management strategies to control future traffic growth.

Other

1) MDPW should study and determine the type of work required to improve sight distance and pedestrian safety at the railroad bridge north of Peach Street.

2) MDPW study the need for potential future improvements at the Route 37-Park Avenue intersection.

The Braintree Highlands Civic Association Route 37 Study Committee reviewed the materials presented to the Route 37 Task Force on April 30, 1987. These materials included the capacity analyses found in Tables 2, 3, 5, 6, 10, 11 and 12, air quality analysis found in Table 7 and the discussion of advantages and disadvantages found in Tables 13 through 18.

The Civic Association continues to believe, in light of the data presented, that a two lane alternative is the most feasible (see letter of May 22, 1987 in Appendix C). The Civic Association has provided the following suggestions for future consideration:

> "That Route 37 be restriped as a two lane road for an indefinite study period. The minimum period should be at least four weeks. Prior to, and during this period, traffic counters should be in place at Holbrook Square, South Street, Peach street, Liberty Street, Route 37 at the Holbrook line, and Route 37 at the Plain Street intersection.
>
> "Road signs would be placed to inform traffic of the change in lane numbers. High Police visibility should be maintained to ensure two lane usage."

II

Description of Corridor

Route 37 in Braintree and Holbrook is an arterial roadway generally serving north-south traffic (Map 1). The section of Route 37 of concern in this study connects Plain Street in Braintree to Route 139 in Holbrook, as specified by the two communities.

Residents and town officials along Route 37 in Braintree and Holbrook have been concerned with traffic safety and operations from Plain Street in Braintree, south to the center of Holbrook. Some feel that the portion in Braintree is too narrow for four lanes and that it should be returned to two or three lanes, the center lane used for left turns. In Holbrook there is concern over the congestion at the intersection of Routes 37 and 139.

The objectives of this study are to:

1. Identify highway projects that will improve traffic operations and safety in this corridor, specifically addressing the concerns of local residents, and comparing scenarios with four lanes two lanes and three lanes; and

2. Identify land use growth management techniques which will minimize future development impact on traffic.

A. Regional Setting

Route 37 is a north-south corridor serving traffic originating in Brockton, Holbrook and Braintree destined for Route 128 and the Southeast Expressway. The corridor generally parallels Route 18 in Weymouth and Route 28 in Randolph.

Route 37 is maintained by the Massachusetts Department of Public Works. The roadway is classified by MDPW as a "State Urban" road for federal highway aid. Route 28 is also classified as a "State Urban" road while Route 18 is classified as a State Primary Highway.

B. Roadway Characteristics

The study area includes 1.08 miles of Route 37 in Holbrook, from the Braintree town line to the intersection of Route 139, and 1.2 miles in Braintree, from Plain Street to the Holbrook town line. According to the Massachusetts Department of Public Works (MDPW) Road Inventory File, the segment of Route 37 in Braintree is 40 feet wide. This width is striped for four lanes of traffic: two northbound and two southbound. In

Holbrook, Route 37 is 28 feet wide serving two lanes of traffic, one northbound and one southbound.

The roadway in the study passes through a residential neighborhood. This results in a large number of curb cuts for residential driveways and local roads. The corridor is served by three traffic signals; these are located on Route 37, at intersections with Plain Street, Johns Avenue and Route 139. A flashing beacon is present at the Route 37 intersection with Peach Street. All other intersections in the corridor, and all driveways, are either stop or yield sign controlled.

C. Traffic Volumes

1) Average Daily Traffic

The Route 37 corridor was the subject of four traffic counts by MDPW during February 1986. At the same time directional counts were taken south of Plain Street (northbound and southbound) and south of Peach Street (northbound and southbound). MDPW counts showed an average weekday traffic volume of 26,170 vehicles south of Peach Street; 13,650 vehicles northbound, and 12,520 vehicles southbound. This compares closely with a reported 26,580 vehicles on Route 18 in Weymouth, also four lanes.

The traffic counts by MDPW reflect a high directional bias during the morning and afternoon peak hours. For example, in the morning peak hour there were 2,280 vehicles from 7 to 8 a.m.; 81% of this traffic was northbound. During the afternoon peak hour, 5 to 6 p.m., 2,140 vehicles were counted; 61% of this traffic was southbound.

2) Turning Movement Counts

Turning movement counts were conducted in August of 1986 at four locations within the study area boundaries (Map 2). These counts were conducted for two-hour periods in the morning and afternoon to determine peak hour conditions. Figures 1-4 provide the peak hour traffic data for the intersections at Route 139 (Figure 1), at South Street (Figure 2), at Peach Street (Figure 3), and at Plain Street and Hancock Street (Figure 4).

Similar to the automatic recorder locations, the peak hour turning movement counts reflect strong directional biases during the peak periods. The morning peak reflects a strong northbound bias and the afternoon peak hour reflects a southbound bias in traffic flow.

D. Land Use

Existing land use for the corridor was reviewed using the Town of

Map 2. Location of Turning Movement Counts

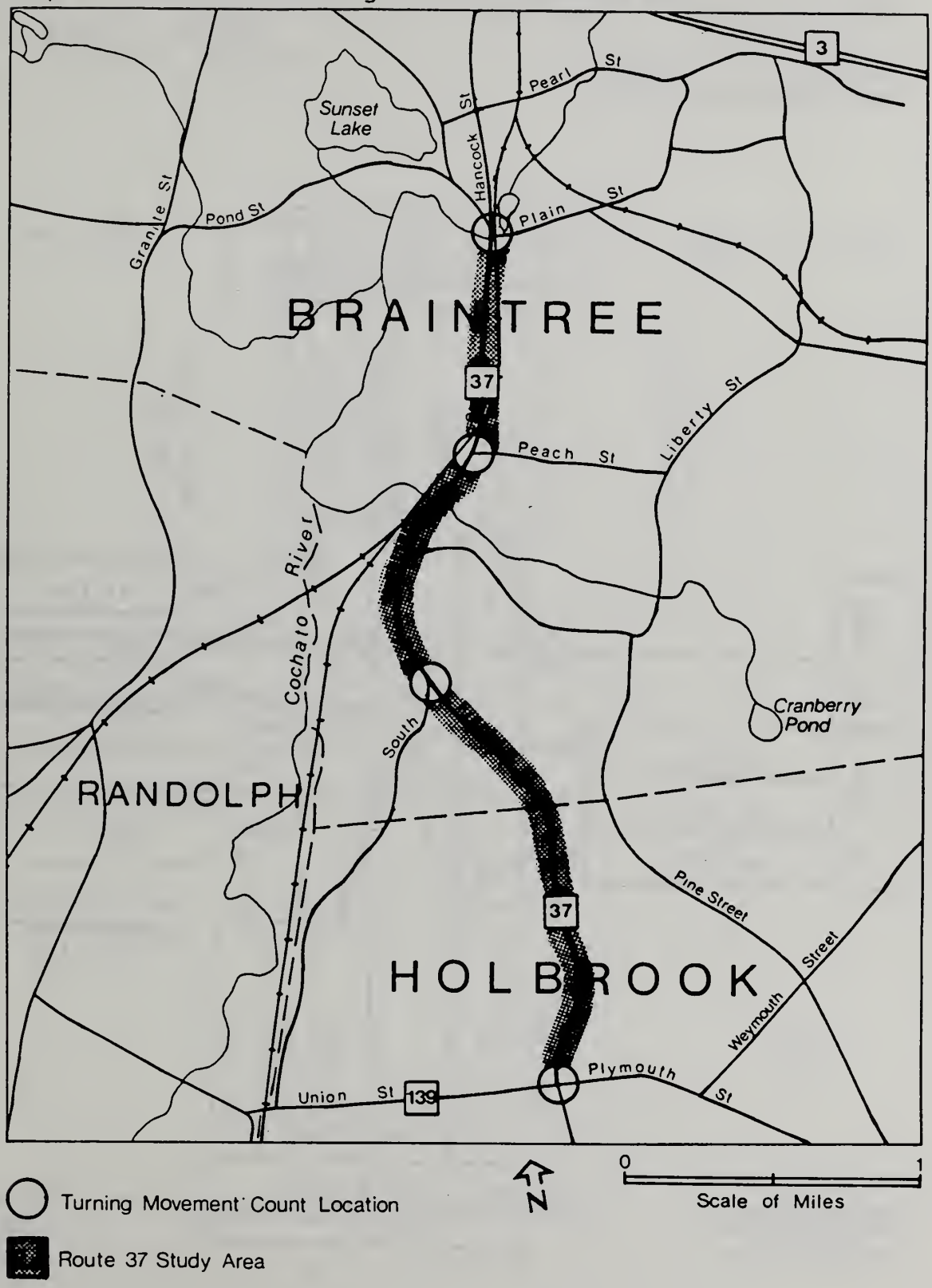


Figure 1. Turning Movements at Holbrook Center

All Vehicles - Peak Periods
Holbrook Center - Rt 37/Rt 139

AM-7:15-8:15 8/7/86
(PM)-(4:45-5:45)(8/5/86)

PHF = .91 (.95)

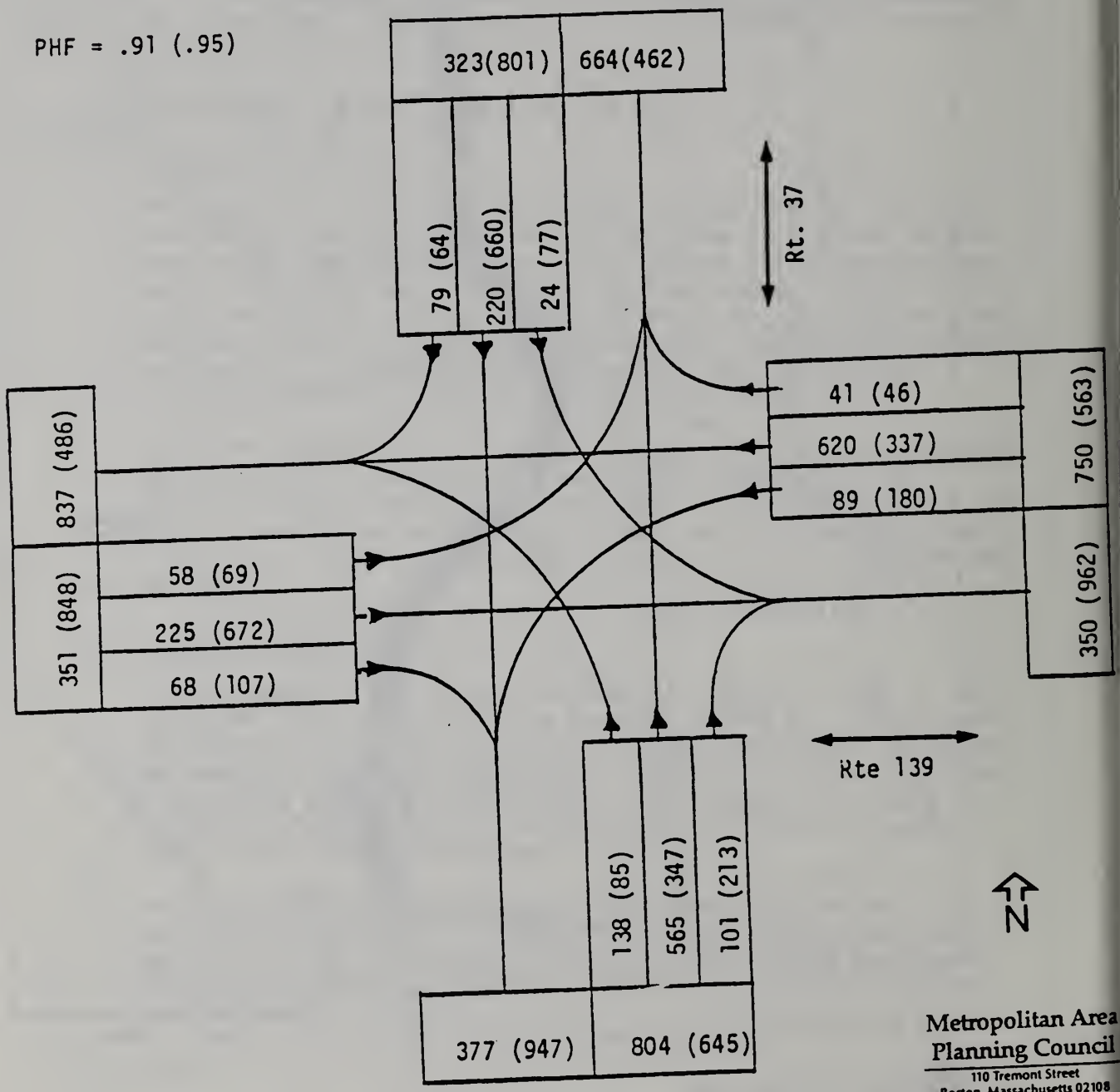


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Figure 2. Intersection of Route 37 and South Street

All Vehicles - Peak Periods
Braintree - Rt 37/South Street

AM - 7:30-8:30 8/13/86
(PM) - (4:45-5:45) 8/12/86

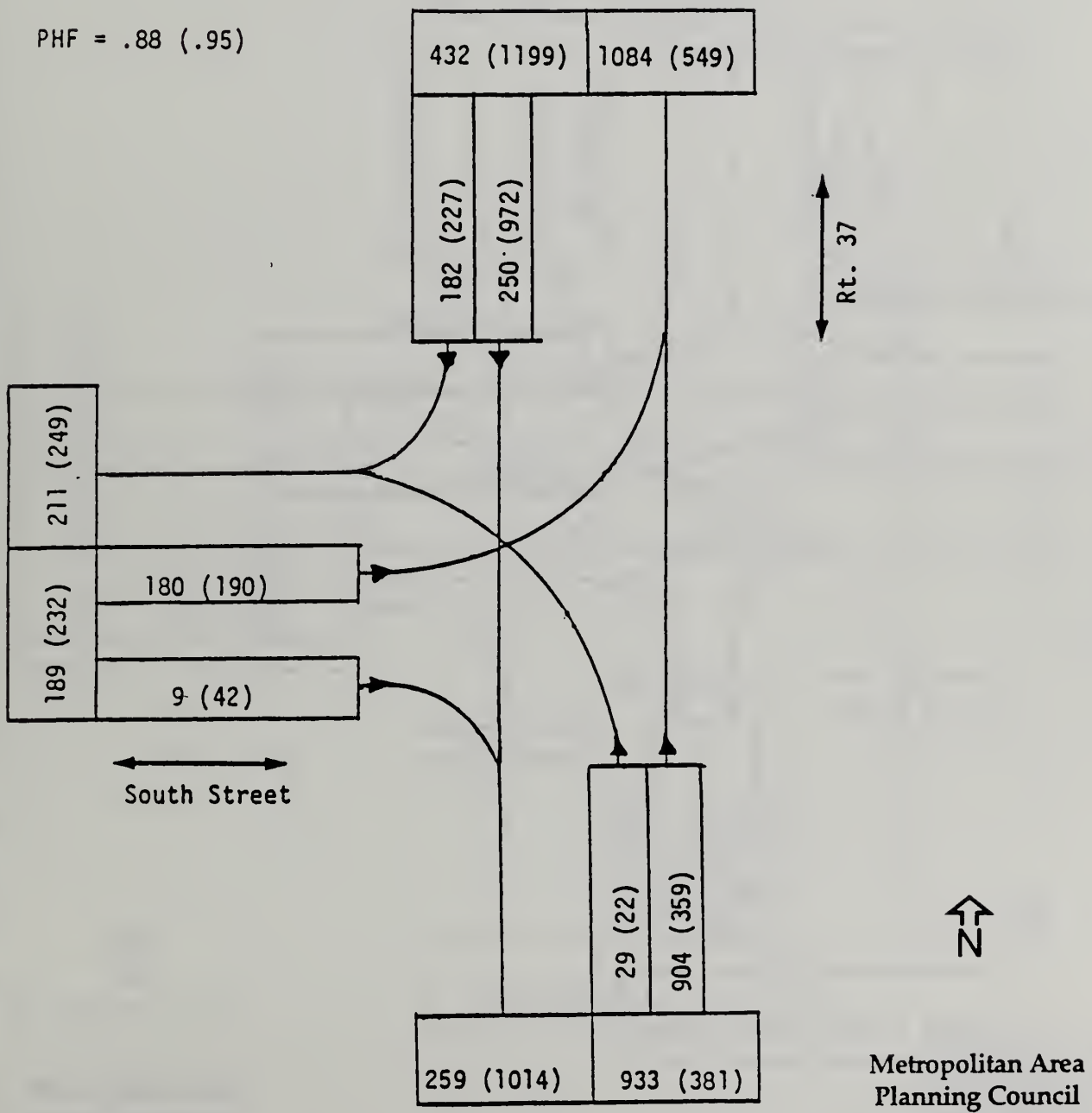

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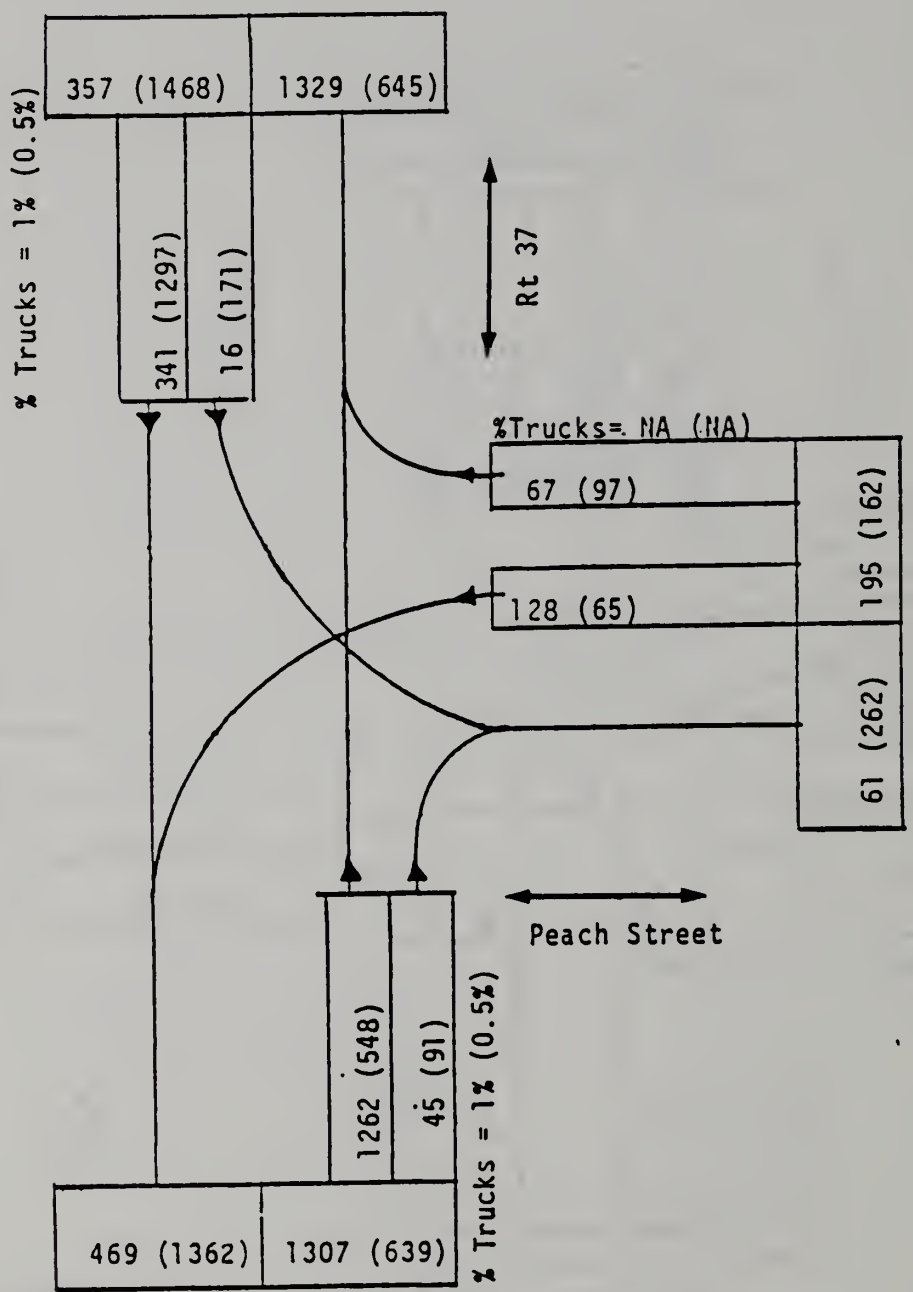
Figure 3. Route 37 at Peach Street

All Vehicles - Peak Periods
Braintree - Rt 37 at Peach Street

AM - 7:15-8:15 8/6/86
(PM)- (5:00-6:00) (8/6/86)



NA = Not Available

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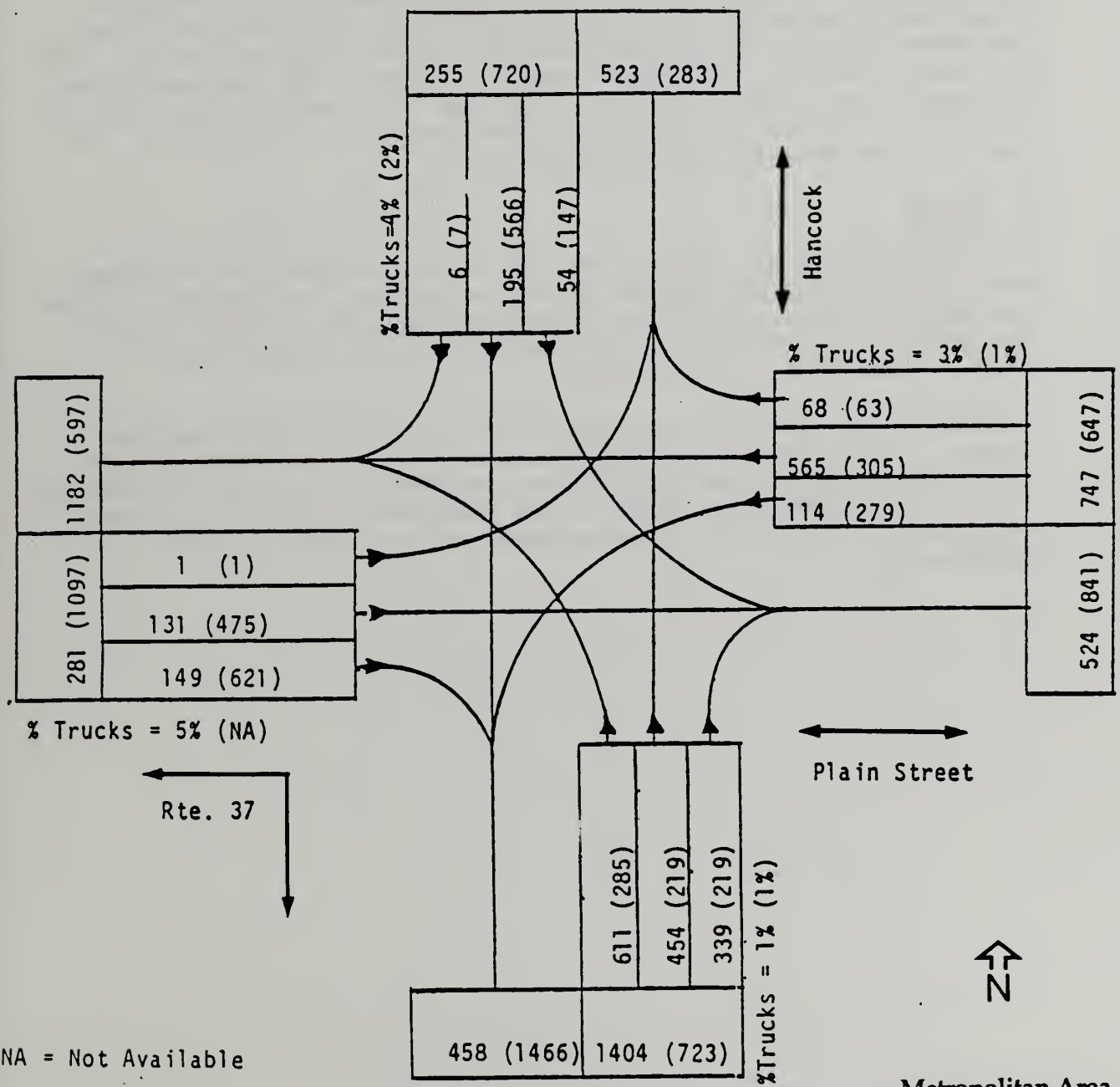
Figure 4. Route 37 at Plain and Hancock Streets

All Vehicles - Peak Periods
Braintree Rt 37 at Plain and Hancock Streets

AM 7:30-8:30 8/12/86
(PM) (4:30-5:30) (8/7/86)



NA = Not Available

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Braintree's Master Plan Update (January 1985), the 1980 MacConnell Land Use Map of Holbrook, and the Metropolitan Area Planning Council's Development Tracking File.

These sources, listed above, show that the corridor in 1985, included predominantly medium to high density residential (i.e. small lot sizes) development, with a few isolated commercial areas along the corridor. The development pattern is consistent with the zoning in the two communities. This zoning has established areas designated for highway business and for residential development with varying densities (i.e. units/acre) of less than 1/2 acre per residential dwelling unit.

E. Growth

The 1985 Braintree Master Plan conducted a full build-out for Braintree based upon existing and proposed zoning ordinances. This analysis studied the resultant impacts of full build-out on, among other things, traffic. The Master Plan identified a 0.6% growth in traffic along the portion of Route 37 considered in this project.

The Master Plan identifies more significant traffic growth along other streets bounding the study area such as Grove and Plain Streets (54.3%) and Hancock Street between Plain Street and Pearl Street (83.5%). Much of this traffic growth could be due to the development potential for land along Liberty Street such as the proposed 400 unit "Town Crossing" development.

III

Problems and Concerns

Residents of the Braintree Highlands, are concerned with the volume and speed of traffic utilizing Route 37. A public meeting on October 9, 1986 was held in Braintree for residents of Braintree and Holbrook to specify the issues to be addressed and suggest alternatives to be considered in this study.

At this meeting the Braintree Highlands Civic Association presented a paper outlining the association's concerns. The paper identifies narrow lane widths, lack of shoulders, high vehicle speeds, pedestrian safety, and inadequate separation between homes and the roadway, as significant problems.

Residents' concerns, voiced at the hearing, were predominantly with the lack of safety under existing conditions. Several cited having been involved in an accident or knowing people who have been in accidents. Specific examples included a vehicle hitting a house, a bicyclist being struck, and pedestrian accidents.

One group of residents indicated trucks and buses cause problems in traffic flow. The concern is that vehicles which are wider than the lane and buses stopping in the travel lane, create traffic backups and force automobiles to pass in a narrow space.

One resident, pointed out that there is a fundamental conflict between the residential area and the road's use as a regional arterial facility. He noted that along the 1.2 mile segment of Route 37 that is four lanes there are 123 driveways and 33 side streets.

A summary of points raised by the residents at the October 1986 meeting includes:

1) The present roadway contains four 9 foot lanes in Braintree while AASHTO standards show a 10' minimum;

2) The surrounding land use, predominantly residential, is incompatible for a high speed arterial;

3) The sight distance at the intersection of Peach Street and Route 37 is restricted due to the vertical alignment of a railroad bridge;

4) Safety; many are afraid to walk along the highway or use front yards due to the speed and volume of traffic. These residents cited incidents of pedestrian and bicycle accidents, as well as one home being struck by a car; and

5) Safety; Route 37 contains what may be considered dangerously narrow lanes for a subregional arterial.

6) Driveway and sidestreet access is difficult due to operating speeds on Route 37; and

7) Large vehicles, such as trucks and buses, maneuver in lanes that are narrower than the vehicles.

Other concerns, which must be addressed in the review of the corridor include:

1) The level of service and capacity of the roadway;

2) Enforcement of local speed limits;

3) The effect, in this corridor, on future growth of Braintree and Holbrook; and

4) The possibility that traffic may be diverted to other residential streets.

IV

Alternatives

A number of alternatives have been identified through meetings with residents, local officials and MDPW. These alternatives are listed below with a brief discussion of each alternative.

A) No Change to Current Highway Conditions

This alternative would leave the roadway exactly as it is today, two lanes in each direction on a 40 foot wide surface in Braintree, and one lane in each direction on a 28 foot wide surface in Holbrook. Massachusetts Department of Public Works staff have suggested that this may be the only viable option for the corridor. This may be considered the default option in that the current situation will most likely remain if the Commonwealth and the towns of Braintree and Holbrook do not agree to implement another alternative.

B) Widen Route 37 To Adequately Accommodate 4 Lanes

This alternative would widen the highway to approximately a 50-foot cross section, which could accommodate four 12-foot-wide lanes but no shoulders, or to an approximately 60-foot cross section to accommodate four 12-foot travel lanes and six-foot shoulders. Due to the proximity of adjacent homes, the general consensus was that this option is not viable.

C) Restripe Route 37 to Two Lanes

This alternative, utilizing the recommendations of the Braintree Highlands Civic Association, would have Route 37 restriped as two 12-foot lanes with six-foot shoulders and a four-foot median. This is the preferred alternative of the Braintree Highlands Civic Association.

D) Restripe Route 37 to Three Lanes

This alternative would create one northbound and one southbound travel lane and a two-way-continuous-left-turn lane down the center of Route 37. This was one of the alternatives raised at the the public meeting in October.

E) Bypass Highway

This alternative had been raised as a possibility in past Braintree master plans. A bypass highway was proposed in 1963 and again in 1976 to be located to the east of Route 37. It was not included in Braintree's most recent (January 1985) master plan. This alternative may be cost prohibitive due to land acquisition costs. The proposed route is also said to pass through environmentally sensitive areas.

F) Transportation Systems Management

Transportation Systems Management (TSM) is the name given to the concept of more efficiently using existing transportation systems by means other than large-scale new construction. TSM embraces a host of measures, all with the purpose of seeking to achieve better results from existing facilities rather than by creating new highways and transit systems.

Transportation Systems Management (TSM) may include intersection signalization where warranted, intersection widening, pedestrian crossing signals, pull-outs for bus stops, additional sidewalks, additional guard rails and landscaping. The transportation systems management actions could also include right-turn-only restrictions, paired one-way side streets, improved signal timing, improved transit service, expanded ridesharing programs (i.e. from the Holbrook Center commuter lot), or the use of the proposed Old Colony Railroad commuter rail project. Any, or all, of the above management actions may be combined with the other five alternatives.

The above six alternatives were discussed with local officials and the Braintree Highlands Civic Association at a meeting on February 5, 1987. At this meeting it was suggested that the following be added to the list of alternatives:

G) Narrow the Roadway and Reduce the Lanes

This alternative would involve removing pavement from either side of Route 37 to reduce the overall width of the roadway, and create a two lane highway with shoulders.

H) Divide Highway

This alternative calls for the construction of a permanent median barrier on Route 37. This alternative could be combined with widening the highway to a standard four-lane cross-section or with restriping the road to two lanes.

I) Place Barriers Between Route 37 and Sidewalks

This alternative may best be considered under transportation systems management (Alternative 6), specifically through the use of additional guard rails.

V

Criteria for Evaluating Alternatives

The criteria for weighing the advantages and disadvantages of the alternatives include capacity/congestion, safety, secondary impacts (on the surrounding road network), air quality, quality of life and feasibility. A brief discussion of each of these criteria follows.

A) Capacity and Delay

The efficiency of traffic operations is measured in terms of capacity and delay. These measurements are usually referred to as level of service (LOS). The LOS characterizes the quality of traffic flow along roadways and at intersections. It is described in terms of levels of service "A" through "F"; where "A" represents the best possible conditions and "F" represents forced-flow or failing conditions. Table 1 describes each level of service.

The level of service for a signalized intersection is defined in terms of delay. Level of service for non-signalized intersections is defined in terms of excess capacity (or deficiency) for the critical movement. Capacity for road segments is measured in terms of speeds and delays. The analysis will utilize these measures, as discussed in the 1985 Highway Capacity Manual.

B) Safety

The analysis attempts to identify the causes of accidents along the corridor and to identify any potential improvements.

The accident rate for each location is also calculated, on an annual basis. The rate is defined as the number of accidents reported in one year divided by the estimated traffic volume served in that year. These rates are compared with the statewide average for signalized intersections, 1.89 accidents per million entering vehicles,[1] for unsignalized intersections, 0.95 accidents per million entering vehicles and for roadway segments, 5.0 accidents per million vehicle miles travelled.[2].

The statewide average accident rate for signalized intersections is 1.89 accidents per million entering vehicles.[1] For unsignalized intersections the rate is 0.95 accidents per million entering vehicles, and for roadway segments the rate is 5.0 accidents per million vehicle miles travelled.[2]

Table 1

INTERSECTION LEVEL OF SERVICE (LOS) DESIGNATIONS*

Category	Description
LOS A:	Describes a condition of free flow, with low volumes and relatively high speeds. There is little or no reduction in maneuverability due to the presence of other vehicles, and drivers can maintain their desired speeds with little or no delays.
LOS B:	Describes a condition of stable flow, with desired operating speeds relatively unaffected, but with a slight deterioration of maneuverability within the traffic stream.
LOS C:	Describes a condition still representing stable flow, but speeds and maneuverability begin to be restricted. The general level of comfort begins to deteriorate noticeably at this level.
LOS D:	Describes a high-density traffic condition approaching unstable flow. Speeds and maneuverability become more seriously restricted, and the driver experiences a poor level of comfort.
LOS E:	Represents conditions at or near the capacity of the facility. Flow is usually unstable, and freedom to maneuver within the traffic stream become extremely difficult.
LOS F:	Describes forced-flow or breakdown conditions with queueing along critical approaches. Operating conditions are highly unstable as characterized by erratic vehicle movements along each approach.

*Source: Highway Capacity Manual, Transportation Research Board Special Report 209; National Research Council, 1985.

Traffic flow changes to Route 37 need to be considered together with potential traffic diversions to surrounding residential streets and other arterials. Analysis of this diversion will be qualitative rather than quantitative.

C) Traffic Diversions

Route 37 is an arterial roadway. Arterial roads are intended to provide direct, efficient traffic flow for through local traffic. Often traffic flow changes in such a corridor result in a diversion of traffic to or from another parallel corridor. The net result of this diversion may be an increase in traffic for one of the corridors.

For this reason, traffic flow changes to Route 37 need to be considered together with potential traffic diversions to surrounding residential streets and other arterials. Analysis of this diversion is qualitative rather than quantitative in this study. If an alterantive with significant traffic diversions carried beyond this study, a network analysis to measure the impacts should be performed.

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1 CTPS Technical Report 54a, Draft Route 9 Corridor Planning Study: Short-Range Element, January 1986.
2. CTPS Technical Report 56a, Highland Avenue/Needham Street Corridor Traffic Study: Existing Conditions, August 1986.

D) Environmental Quality

In order to protect the public health, the Clean Air Act of 1970 required that the Environmental Protection Agency (EPA) establish national air quality standards for five major air pollutants: sulfur dioxide, carbon monoxide, total suspended particulates, nitrogen dioxide, and ozone (smog). Because the Boston region is an air quality non-attainment area, all traffic circulation changes must be examined for impacts on air quality.

This criteria also addresses the impacts an alternative may have on other parts of the environment, such as wetlands.

E) Quality of Life

MAPC reviewed the above criteria with the local officials and the Braintree Highlands Civic Association at the February 5, 1987 meeting. Those present at this meeting suggested that impacts on the quality of life be added to the criteria for evaluating each alternative. This analysis would include noise, fumes, the inconvenience of traffic to pedestrians and vehicles wanting to cross the traffic stream, and the anxiety to residents due to unsafe conditions.

F) Feasibility

A brief discussion of the feasibility of each alternative is included. This discussion will touch on the availability of funding for improvements and political concerns that may arise due to each alternative.

VI

Analysis of Alternatives

A. No Change to Current Highway Conditions

1) Summary

Traffic capacity problems in the corridor were identified by Braintree in 1963, in the town's Master Plan. While several recommendations were made at this time, none were implemented.

In 1976 the Braintree Master Plan Update again identified Route 37 as deficient due to capacity constraints.

If the Towns of Braintree and Holbrook were to leave Route 37 as it currently is, the roadway would operate with adequate capacity. However, unsafe conditions would be present for pedestrians and vehicles attempting to enter or exit the traffic stream. These conditions may lead to some traffic diversions to alternate routes, air quality may decrease due to these diversions and general growth of the area, and the quality of life for residents of the area would probably decrease.

2) Capacity and Delay

Capacity analysis conducted by CTPS revealed that the corridor, in general, operates at acceptable levels of service during morning and evening peaks.

The level of service in the corridor ranges from "A" to "C" except on two segments during the afternoon peak hour (Table 2). Table 2 provides the average speeds recorded in the Route 37 corridor. In the p.m. peak hour the lowest average speeds are found at the ends of the corridor where the highway drops down to two lanes from the four lanes in the study area.

Table 3 describes the conditions found at four intersections in the Route 37 corridor. The table shows the average delays and estimated levels of service for vehicles on Route 37. The table shows that, except for traffic at the intersection of Route 37 and Route 139, and traffic attempting to enter the Route 37 traffic flow from Peach and South Streets, the intersections all operate at an acceptable level of service.

Table 2

Levels of Service and Average Speeds
In the Route 37 Corridor (Existing)

Northbound

Segment	AM LOS	AM SPEED (MPH)	PM LOS	PM SPEED (MPH)
Rt. 139 to Johns	A	(36)	A	(35)
Johns South	A	(37)	A	(37)
South to Peach	A	(38)	A	(38)
Peach to Plain	C	(27)	E	(16)
Overall Summary	B	(34)	B	(29)

Southbound

Segment	AM LOS	AM SPEED (MPH)	PM LOS	PM SPEED (MPH)
Plain to Peach	A	(37)	B	(33)
Peach to South	A	(38)	A	(38)
South to Johns Ave.	A	(37)	A	(35)
Johns Ave. to Route 139	B	(31)	F	(10)
Overall Summary	A	(35)	C	(22)

Existing intersection geometry, signal phasing and timing.

Table 3

Intersection Analysis for Existing Conditions*

Intersection	Movement	AM		PM	
		LOS	DELAY	LOS	DELAY
Rt. 37/Hancock/Plain	Overall	C	(23.5)	D	(39.6)
Rt. 37/Peach	SB Left	C	(14.5)	B	(9.2)
	Peach WB	F	(Inf)	F	(Inf)
Rt. 37/South	NB Left	A	(5.2)	C	(13.2)
	EB Left	F	(Inf)	F	(Inf)
	EB Right	A	(4.1)	A	(7.0)
Rt. 37/Rt. 139	Overall	E	(53.8)	F	(Inf)

Assumes existing intersection geometry, signal timing and phasing.

A "do nothing" approach to Route 37 will not address the issues raised by residents of the area, specifically the delay incurred by vehicles attempting to enter the traffic stream from side streets and driveways.

3) Safety

Accident data from the files of the Braintree and Holbrook Police Departments was compiled for all accidents occurring from August 1, 1984 to June 30, 1986 in the Route 37 corridor. A total of 173 accidents occurred during the 23 months that were reviewed. Table 4 summarizes the accident data collected.

The Route 37 corridor compares favorably to the statewide averages for accident rates at intersections (Table 4). The only interesection with an accident rate close to that of the state average is Route 37 and Peach Street with a rate of 0.91 accidents per million entering vehicles, 0.04 below the state average for unsignalized intersections.

On the other hand, three of the road segments reveal higher than average accident rates. At 4.65 accidents per million vehicle miles travelled, the segment of Route 37 in Holbrook is the only segment of the study area below the state average.

The "do nothing" alternative will not address the safety deficiencies in the Route 37 corridor.

4) Traffic Diversions

The "do nothing" alternative for Route 37 has the potential to divert traffic to the surrrounding roads as the perception increases that the corridor is "unsafe." Should such a diversion occur congestion and safety problems on these local streets will occur.

5) Environmental Quality

The capacity and delay analysis reports few problems in the corridor at present. However, at those locations, at the lane drops and the intersections at either end of the corridor where bottlenecks occur, air quality is poorer than elsewhere in the corridor.

6) Quality of Life

The citizens of this section of Braintree have identified a number of roadway related problems as having a negative impact on their quality of life. These are discussed above under "Problems and Concerns." The "do nothing" alternative will not address these concerns.

7) Feasibility

The status quo is, of course, the most feasible option - requiring no change, no new resources and no political support.

The Transportation Improvement Program (TIP) for the Boston region is currently oversubscribed. Many more projects exist in the TIP than can be funded in the next five years. This being the case a "do-nothing" alternative may be the only financially feasible option for the near future.

B. Widen Route 37 to Accommodate Four Lanes

1) Summary

The 1976 Braintree Master Plan Update[1], recommended that Route 37 be widened from the Holbrook town line to Peach Street. This widening (an undetermined width in the Master Plan) would have created a roadway that could accommodate four lanes of traffic on a proper travel way. Map 3 illustrates the area of the proposed widening.

The proposal was to be coordinated with the proposed extension of Ivory Street to Peach Street. As part of the MBTA Red Line Extension Ivory Street has been extended to Plain Street. For the purposes of this study any widening should be considered as occurring throughout the corridor, i.e. fom the Plain Street intersection through the Route 139 intersection.

A widened Route 37 will provide improved capacity in the corridor. However, widening will not, necessarily, address inherent safety problems in the corridor. Likewise, a widened highway may draw added traffic to Route 37, increasing congestion and vehicle emissions. A highway widening for Route 37 would require extensive land takings.

[1]Charles E. Downe and Peter L. Wells, Planning Consultants, 1976.

Table 4

Accidents On Route 37
(August 1, 1984 to June 30, 1986)

Intersection	Total for 23 Months Collected	Annual Average	Accident Rate
Route 37, Plain St. & Hancock	12	6.3	0.27[2]
Route 37 & Peach St.	29	15.1	0.91
Route 37 & South St.	19	9.9	0.75
Route 37 & Route 139(s)	13	6.8	0.33
MDPW Average (signalized)			1.89
MDPW Average (unsignalized)			0.95
Segment[1]			
Between Plain & Peach Sts.	62	32.3	5.64[3]
Between Peach & South Sts.	76	39.7	6.82
Between South St. & Braintree-Holbrook Line	40	20.9	7.07
Between Braintree-Holbrook & Rt. 139	39	20.3	4.65
MDPW Average			5.00

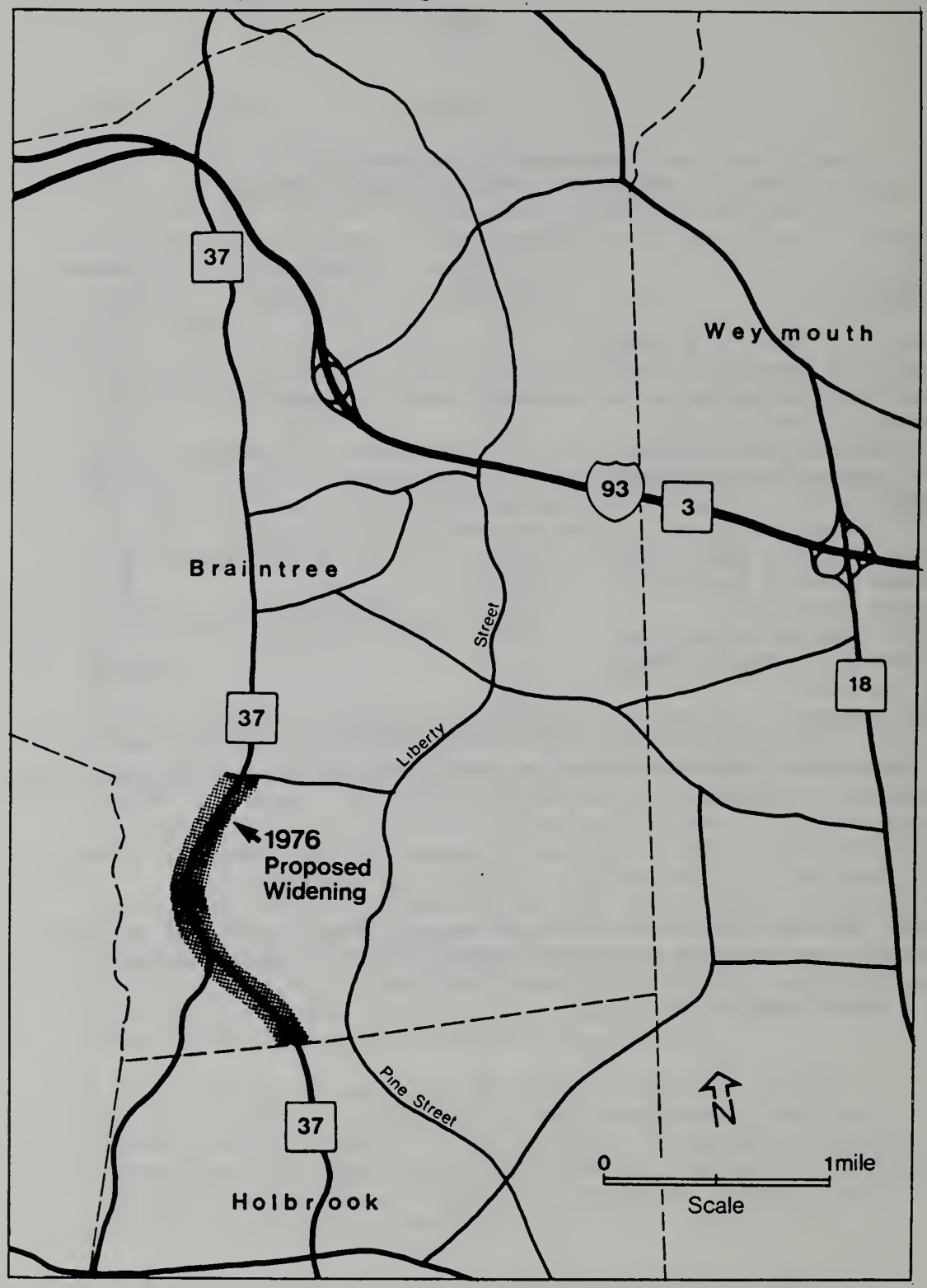
[1] Segments' accident data includes accidents at the intersections that determine its bounds.

[2] Intersection accident rates are a measure of the number of accidents that occur per million vehicles entering the intersection.

[3] Road segment accident rates are a measure of the number of accidents that occur per million vehicle miles travelled across the segment.

(S) = Signalized intersection

Map 3. 1976 Proposed Widening



Source: Master Plan Update, Braintree, Mass., May 1976, Charles E. Downe & Peter L. Wells, Planning Consultants

2) Capacity and Delay

Even a modest widening of Washington Street could improve traffic flow by reducing lateral friction.

A widening of Route 37 south of the Braintree-Holbrook line to the Route 139 intersection would allow four lanes where traffic now must merge to two lanes southbound (Table 5). Improvements carried through the Route 139 intersection could further improve traffic flow.

Widening Route 37 would necessarily address the replacement of the highway bridge over the railroad north of Peach Street to allow four lanes. The bridge needs to be replaced under this alternative because failure to do so would constrain traffic flow. The bridge could be constructed to eliminate the current sight distance problem.

At the northern terminus of the corridor congestion could be alleviated by carrying the widening through the Plain Street - Hancock Street - Washington Street intersection.

The widening of Route 37 will not address delays associated with traffic attempting to enter Route 37 from side streets at unsignalized locations. These vehicles will continue to be faced with a traffic stream with insufficent gaps.

3) Safety

The accident data collected for Route 37 exhibits two distinct non-intersection characteristic. These trends reflect insufficient lateral clearance and possibly roadway curvature. The widening of Route 37 would definitely address the former problem and could be designed to address the latter to some extent.

A review of the accident data indicated 23 of the 173 accidents in the corridor were related to lane width. Similarly, 52 accidents appear to be related to roadway curvature.

While it is not possible to estimate the reduction in accidents that might occur due to roadway widening, it is clear that the reduction in vehicle conflicts would result in fewer accidents of this type.

Widening Route 37 could tend to increase vehicle speeds unless adequate enforcement were provided for in the highway design. This would include shoulders or other pullouts for police vehicles.

Increased vehicle speeds would increase the difficulty of entering side streets or driveways. Accleration and deceleration lanes might be necessary at unsignalized intersections.

Table 5
Estimated Average Speeds and Level of Service[1]
In the Route 37 Corridor (Highway Widening)

Northbound

Segment	AM				PM			
	Existing		Widened		Existing		Widened	
	LOS	SPEED(MPH)	LOS	SPEED (MPH)	LOS	SPEED(MPH)	LOS	SPEED (MPH)
Route 139 to Johns Ave	A	(36)	A	(36)	A	(35)	A	(35)
Johns Ave to South St	A	(37)	A	(37)	A	(37)	A	(37)
South to Peach St	A	(38)	A	(38)	A	(38)	A	(38)
Peach St. to Plain St	C	(27)	C	(27)	E	(16)	E	(16)
Overall Summary	B	(34)	B	(34)	B	(29)	B	(29)

Southbound

Segment	AM				PM			
	Existing		Widened		Existing		Widened	
	LOS	SPEED(MPH)	LOS	SPEED (MPH)	LOS	SPEED(MPH)	LOS	SPEED (MPH)
Plain to Peach	A	(37)	A	(37)	B	(33)	B	(34)
Peach to South	A	(38)	A	(38)	A	(38)	A	(38)
South to Johns Ave.	A	(37)	A	(37)	A	(35)	A	(35)
Johns Ave. to Rte. 139	B	(31)	B	(31)	F	(10)	C	(28)
Overall Summary	A	(35)	A	(35)	C	(22)	B	(33)

[1] Level of Service based upon optimal signal phasing, timing and 12 foot lanes at signalized intersections for widened roadway conditions.

4) Traffic Diversions

A safe and efficient Route 37 corridor would remove some traffic from surrounding residential streets. This would allow those streets to serve local traffic and to be free of intrusions from excess traffic.

The 1976 Braintree Master Plan Update expresses this objective indicating the advantages of roadway widenings in general:

> "Nonetheless, there is a valid point to be raised in this connection, namely, that much traffic is forced onto local streets in the middle of residential neighborhoods in orderto bypass the congestion on the major thorough-fares. Therefore, a first priority for improvement action should be to increase the capacity of major thoroughfares, rather than making improvements to the local streets."

The widening of Route 37 could draw traffic from neighboring roads. This could counteract positive impacts on congestion and air quality, to some extent.

5) Environmental Quality

The widening of Route 37 should have a positive impact on air quality in the corridor by improving the flow of traffic in the PM peak hour.

6) Quality of Life

In order to widen Route 37 and provide for all the facilities the corridor could require for safety and capacity major land takings would have to occur. This would result in some loss of front yards and, possibly, some homes. Homes that were not taken would find the highway closer to their front doors than the present highway.

7) Feasibility

The feasibility of major reconstruction and widening appear to be quite limited. First, it is doubtful that the money would be available for such an undertaking. Second, it is not likely that local residents and officials would want to pursue this alternative. A major widening of Route 37 might require the purchase of all the impacted properties, rather than just the necessary right-of-way.

C. Restripe Route 37 to Two Lanes

1) Summary

Braintree Highlands Civic Association has recommended reduction in the number of lanes on Route 37 from four to two. At the October 9, 1986 public meeting the Braintree Highlands Civic Association offered the following recommendations for the Route 37 corridor:

"1. Removal of current fog lines and placement of new fog lines six feet from the curbing.
2. Designation of 12-foot traveling lanes, one northbound and one southbound.
3. Change substandard (painted) median width from 15 inches to 4 feet.
4. Signs along the roadway informing the public of single-lane usage."

A reduction to two lanes on Route 37 will result in a level of service "E/F" on the highway. This will mean a doubling of Hydrocarbon and Carbon Monoxide emissions in the area.

A lane reduction would reduce peak hour vehicle speeds to less than 20 miles per hour. These conditions would tend to reduce speed related accidents but could increase other types of accidents, i.e. rear-end or angle accidents. A lane reduction would not address inherent roadway curvature problems.

2) Capacity and Delay

Traffic volumes provided by the Massachusetts Department of Public Works reveal a peak hour two-way volume of approximately 2100 vehicles on the average weekday. A reduction in the number of lanes would result in a level of service "E/F" in the corridor.

This increase in delay for the corridor will result in increased delay for traffic exiting unsignalized side streets and driveways (Table 6). Very few gaps will exist in traffic sufficient for safe vehicular access to Route 37.

3) Safety

One concern cited on numerous occasions by the residents of Braintree Highlands area is that of excessive speeds. The average speeds measured in the Route 37 corridor during the speed and delay study support this concern. During the peak hours average speeds of 35+ miles per hour were

Table 6
Intersection Analysis for the Two Lane Alternatives

Intersection	Movement	AM Existing		AM Two Lane Condition[1]		PM Existing		PM Two Lane Condition[1]	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Rt. 37/Hancock/Plain	Overall	C	(23.5)	C	(20.5)	D	(39.6)	D	(39.6)
Rt. 37/Peach	SBLeft	C	(14.5)	B	(11.1)	B	(9.2)	A	(7.2)
	Peach WB	F	(Inf)	F	(Inf)	F	(Inf)	F	(Inf)
Rt. 37/South	NB Left	A	(5.2)	A	(4.5)	C	(13.2)	B	(10.3)
	EB Left	F	(Inf)	F	(Inf)	F	(Inf)	F	(Inf)
	EB Right	A	(4.1)	A	(4.8)	A	(7.0)	C	(13.6)
Rt. 37/Rt. 139	Overall	E	(53.8)	C	(15.3)	F	(Inf)	C	(15.4)

[1]Level of Service based on the intersections of Route 37 with Plain Street and Route 139 having Route 139 having present geometry and optimal signal timing, and the intersectionsof Route 37 with Peach Street and South Street having one-lane northbound and southbound approaches.

Measured on the section of Route 37 between Peach Street and South Street (Table 2). Ironically this segment also experienced the largest number of accidents (Table 4).

The reduction in lanes could act to reduce speeds in the corridor by increasing congestion. The lane reduction might also result in less variation in vehicle speeds in the corridor. Both of these improvements could mean fewer speed-related accidents.

A reduction in the number of lanes on Route 37 might mean more intersection related accidents. As motorists find fewer and fewer adequate gaps in traffic to enter the flow, they would find it necessary to "force" their way into the vehicle stream in inadequate gaps. This could lead to an increase in angle accidents.

Likewise, motorists stopping to turn off of Route 37 would also experience increased safety problems. As they face the challenge of crossing through the opposing flow of traffic, the risk of being hit by another vehicle will increase. Drivers also need to be concerned that traffic following behind them will recognize that they are preparing to stop and turn.

Motorists, in areas of congestion, often use shoulder areas as travel lanes. This is quite common in greater Boston, leading to the need to post signs informing of prohibitions on travel in the breakdown lanes. This problem could be a distinct possibility along Route 37 since motorists are accustomed to four lanes. Such use of a six-foot shoulder could prove to be a major safety problem.

4) Traffic Diversions

A lane reduction on Route 37 would be contrary to the 1976 Braintree Master Plan Update which recommends capacity increases on the town's arterial roads in order to relieve pressure on the local roads. This alternative would have the reverse effect.

Lane reduction on Route 37 would cause numerous traffic diversions as motorists seek to find alternatives to crossing or using Route the intersection of Liberty Street and Union Street is described as a serious problem due to alignment and grade.

Other streets would also experience increases in traffic as motorists seek to avoid certain areas or turns. These streets could include such east west corridors as Johns Avenue, Route 139, and Weymouth and Center Streets in Holbrook, and Bradford Road, Park and Wildwood Avenues, and each, Grove, Plain and South Streets in Braintree. Further study including a network analysis, would be necessary to determine the magnitude of diversions and impacts of traffic on these facilities.

5) Environmental Quality

Increases in delays would have a deleterious effect on air quality. Traffic diversions and the increase in vehicle miles travelled would also have an impact on air quality. Emissions in the Route 37 corridor would be expected to double under the two lane alternative (Table 7).

In general it can be assumed that a lane reduction on Route 37 would diminish air quality well beyond the corridor itself.

6) Quality of Life

The lane reduction alternative for Route 37 would reduce some safety concerns of residents of the Braintree Highlands. The creation of six-foot shoulders would increase the distance between the travel lanes and the homes; this would increase the "sense of safety" people will have when using front yards or walking along the highway.

Residents along Route 37 and adjacent parallel streets would need to live with increased traffic if the roadway were narrowed. This congestion will increase noise and exhaust fumes in these areas. The lane reduction alternative would have a negative impact on residents in the Highlands as well as in many other neighborhoods.

7) Feasibility

Lane reduction would require little capital outlay in the Route 37 corridor, predominantly paint and road side signs. From the standpoint of cost that could make this alternative attractive.

This section of Route 37 is under the jurisdiction of the Massachusetts Department of Public Works (MDPW). Any agreement between the MDPW and the towns of Braintree and Holbrook would need to be responsive to the concerns of both residents and highway users on Route 37 and also on other facilities which would serve traffic diverted from Route 37.

D. Restripe Route 37 to Three Lanes

1) Summary

Residents attending the October 9, 1986 public meeting raised the possibility of restriping Route 37 to a three-lane configuration. The concept was to create a continuous two-way left-turn median lane down the center of Route 37. It was suggested that such a change would provide a degree of safety to left-turning traffic on Route 37.

The use of a continuous two-way left-turn median lane is not an advisable procedure for roads in residential areas. These techniques are usually reserved for areas with high volume driveways, an occurrence that is not present in a residential neighborhood.

A three-lane cross-section would reduce available capacity and increase vehicle emissions. While conditions would not be as intolerable as a two-lane road (LOS "E/F") the level of service would be nearly as low.

The three-lane cross-section would also lend itself to a possible increase in head-on conflicts as vehicles use the center lane as an accel/decel lane for turns.

2) Capacity and Delay

The continuous two-way left-turn median lane would provide a common space for vehicles traveling in either direction to change speeds and to queue for left-turn movements at any location along the roadway. The separation of left-turning traffic from the remainder of the traffic stream would allow smoother flow of main-line traffic. The use of such a lane on Route 37, in conjunction with a reduction in lanes for main-line traffic, would result in less delay on the highway than would occur from a simple lane reduction.

A reduction in lanes from four to three would result in increased congestion. While the impact would not be as severe as a reduction to two lanes, a three-lane cross-section will result in main-line traffic being restricted to two lanes.

Increased delay for the corridor would result in increased delay for traffic exiting side streets and driveways (see Table 6). Very few gaps will exist in traffic sufficient for safe vehicular access to Route 37, especially in peak periods.

Table 7
Air Quality Analysis

	Existing Emissions			Two 12-foot Lanes[1]		
	Hydrocarbons	Carbon Monoxide	Oxides of Nitrogen	Hydrocarbons	Carbon Monoxide	Oxides of Nitrogen
AM Peak Hour						
Northbound	1.1	12.4	3.0	2.1	26.5	2.6
Southbound	1.1	12.0	3.1			
PM Peak Hour						
Northbound	1.3	14.8	2.9	2.1	26.5	2.6
Southbound	1.6	19.6	2.7			

NOTE: Calculations were done with 1986 traffic volumes, without the effect of potential traffic diversions.

[1] Two-way emissions.

3) Safety

The continuous two-way left-turn media lane can provide a "safe harbor" for qeued left-turns. Removing these conflicting movements from main-line traffic should result in fewer rear-end type accidents along the corridor than would occur with a simple lane reduction.

Residential areas are not considered to be ideal for the use of continuous two-way left-turn median lanes. These areas typically include a large number of low volume curb cuts, i.e driveways. A roadway using a continuous two-way left-turn median lane in a residential area would experience a large number of conflicts in the median lane (head-on collisions).

It is also not uncommon for vehicles to use the median lane for passing or as an acceleration/merge lane for traffic turning left into the traffic stream. While this use is not the intent of the median lane, unless increased enforcement of traffic rules occurs with the change it may be a common occurrence on Route 37.

4) Traffic Diversions

As discussed above, a reduction in lanes from four to two would result in traffic diversions to adjacent streets. A three lane configuration with the continuous two-way left-turn median lane provides capacity for more vehicles than a two lane configuration. Thus, this alternative should result in fewer diverted trips than the two lane alternative.

The loss of roadway capacity resulting from lane reduction on Route 37 would likely increase traffic diversions to neighboring strets. This would be contrary to the 1976 Braintree Master Plan Update, as discussed earlier. Thus, this alternative is not supported by the town's current comprehensive plan.

5) Environmental Quality

Increases in delay under this alternative would increase air pollution emissions. Traffic diversions and increases in vehicle-miles travelled would also have an adverse impact on air quality.

6) Quality of Life

Restriping Route 37 to accommodate two lanes and a continuous two-way left-turn median lane could have positive impacts on quality of life in the Route 37 corridor. A lane reduction from four to three lanes would move traffic a bit farther away from the houses along Route 37. The lane reduction will also result in slower traffic movement in the corridor. And, the continuous two-way left-turn median lane would provide a separation of turning traffic from main-line traffic.

This alternative would result in increased congestion on Route 37 and adjacent streets and, therefore. Increased noise and exhaust fumes. The alternative would have a negative impact on residents in the Highlands as well as in some other neighborhoods such as the Liberty Street area.

7) Feasibility

In order to implement this alternative, local officials and the Massachusetts Department of Public Works would need to come to an agreement that this is a desirable alternative. Due to the possibility of traffic diversions, local officials would also need to be responsive to the concerns of those to be impacted in other neighborhoods.

E. Bypass Highway

1) Summary

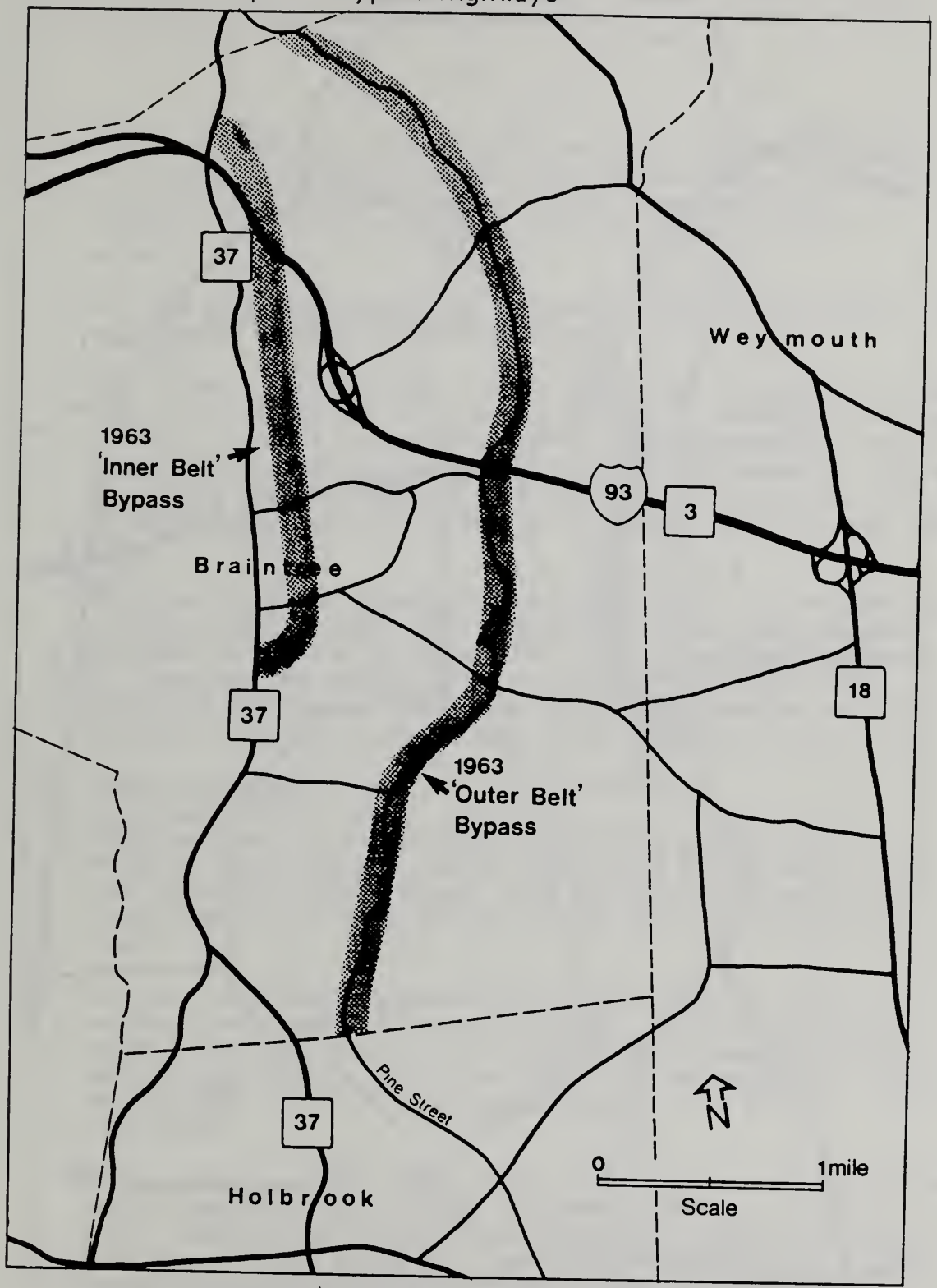
Traffic problems in the Washington Street corridor have been noted for many years. The 1963 Master Plan for Braintree, MA, prepared by Charles E. Dowe, a planning consultant, identified two bypass highway possibilities to relieve congestion on a portion of Washington Street and Route 37.

The 1963 Master Plan identified the use of "inner-" and "outer-belt" bypasses (Map 4). The "inner-belt" proposal would have created a new road to the east of Route 37, extending Ivory Street to meet Route 37 south of Plain Street. The "outer-belt" proposal would have followed the Liberty Street alignment, with the extension of Liberty Street to meet with Commercial Street. This "outer-belt" would have required a new bridge crossing the Monatiquot River.

In 1976 the same consultant prepared a Master Plan Update for Braintree. The update reduced the recommendations related to the Route 37 corridor due to concern for the large number of wetlands which would need to be crossed and adverse impacts on the Cedar Swamp.

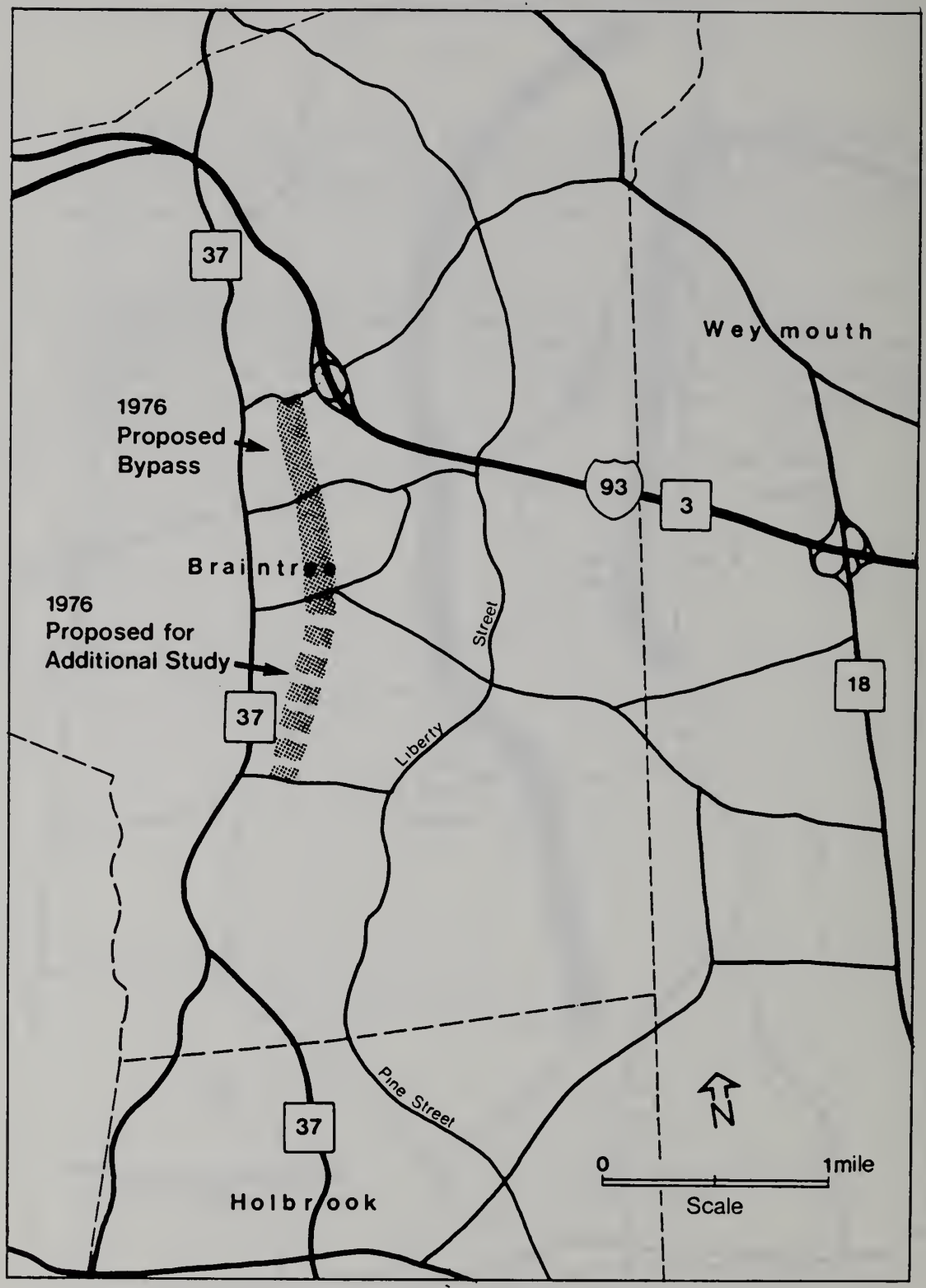
The Master Plan Update did recommend that an extension of Ivory Street be constructed between Pearl Street and Plain Street (completed in 1982) and that Braintree study a further extension to Peach Street (Map 5). The update also proposed that Braintree pursue the widening of Route 37 from Peach Street to the Holbrook town line.

Map 4. 1963 Proposed Bypass Highways



Source: Master Plan Update, Braintree, Mass., May 1976, Charles E. Downe & Peter L. Wells, Planning Consultants

Map 5. 1976 Proposed Bypass Highways



Source: Master Plan Update, Braintree, Mass., May 1976, Charles E. Downe & Peter L. Wells, Planning Consultants

The loss of one lane of traffic on Route 37, and the designation of a second for a continuous two-way left-turn median lane would result in traffic diversions to adjacent streets. Such a diversion could lead to the need for improvements to other streets.

The 1985 Braintree Master Plan prepared by Connery Associates does not identify any specific transportation improvements.

This review by the MAPC does not purport to be an exhaustive study of a bypass highway as an option to the use of Route 37 by through traffic. If the Braintree Board of Selectmen decide that this is the option of their choice, an engineering study would be required to identify specific impacts such a road would have on the town. The advantages and disadvantages to this alternative are described below.

The above described bypass highway proposals could serve to reduce traffic volumes on Route 37. Such an occurrence should improve the level of service and reduce the number of accidents on Route 37. However, the outer-belt proposal would place additional traffic in an adjacent residential neighborhood andthe inner-belt proposal would have a deleterious impact on wetland areas.

2) Capacity and Delay

The "outer-belt" bypass proposed in the 1963 Master Plan for Braintree would create a roadway which could divert some traffic from Route 37. Such a bypass would not require extensive new right-of-way as it would follow, for the most part, existing roads.

The 1963 "inner-belt" proposal could reduce traffic at the intersection of Route 37 and Plain Street. The 1976 proposed bypass could also result in less traffic at the intersection of Route 37 and Plain Street as well as at the intersection of Peach and Route 37 if it were extended through to Peach Street as described.

Of the above discussed bypass highways only the outer-belt" bypass proposal would address traffic throughout the Route 37 study area. However, the 1976 Braintree Master Plan Update identified the Liberty Street corridor's "curvilinear alignment and narrow width" as being problematic and stated that it would provide little additional capacity.

3) Safety

The idea of a bypass highway is to remove traffic from Route 37. Such a reduction should result in a decrease in the opportunity for accidents to occur. This should mean fewer total accidents would occur on Route 37 in the bypassed areas. Table 8 estimates the reduction in the number of accidents that might be anticipated if the combined bypass proposals discussed above were to remove 5000 vehicles per day from the corridor.

Table 8
Estimated Annual Accident Reduction On Route 37
With Bypass Highway

	Existing Annual Accidents	Existing Accident Rates	Number of Fewer Accidents
Intersections			
Route 37 & Peach Street	15.1	0.91[2]	2
Route 37 & South Street	9.9	0.75	1
Route 37, Plain St. & Hancock St.	6.3	0.27	1
Route 37 & Route 139	6.8	0.33	1
Segments			
Between Plain & Peach Streets		1	
Between Peach & South Streets		1	
Between South St. & Braintree-Holbrook Line		0	
Between Braintree-Holbrook Line & Route 139		1	

#f

A bypass of Washington Street would not address the inherent safety problems along Route 37. The bypass would not improve the sight distance problem at the Peach street intersection caused by the railroad bridge and it would not address the curvature of Route 37 between Brewster Avenue and Park Avenue.

While a bypass of Route 37 might result in a reduction in the total number of accidents in the study area annually, it most likely would not result in any decrease in the accident rate (accidents per million vehicle miles travelled) for the corridor.

If the 1963 "outer-belt" bypass proposal were pursued by the Town of Braintree improvements would be necessary for Liberty Street to address roadway deficiencies.

4) Traffic Diversions

The "outer-belt" proposal would divert traffic from Washington Street (Route 37) to Liberty Street, in essence from one residential neighborhood to another.

5) Environmental Quality

The creation of a bypass system of highways would result in some improvement in air quality in the Washington Street Corridor through the removal of traffic from the corridor.

The addition of a significant amount of traffic to the Liberty Street Corridor, which is described as having little available capacity in the 1985 Braintree Master Plan, would result in diminished air quality in this corridor.

The construction of one of the "inner-belt" proposals would require the crossing of numerous wetlands. This would make pursuing this option unpopular among environmental groups. This option would also require the displacement of homes and businesses to be completed.

6) Quality of Life

A bypass highway would result in an improved quality of life for those living in the Washington Street corridor. This would occur due to the reduction of through traffic using Washington Street, the concurrent reduction in the number of accidents, and improved air quality.

The construction of a bypass highway would not provide a timely response to the concerns of the residents of the Highlands area.

7) Feasibility

A bypass highway would require a large expenditure of funds that may not be available. The oversubscription of the region's Transportation Improvement Program makes the funding of a bypass highway unlikely.

F. Transportation Systems Management

1) Summary

Transportation Systems Management (TSM) is the name given to the concept of more efficiently using existing transportation systems by means other than large-scale new construction. TSM embraces a host of measures, all with the purpose of seeking to achieve better results from existing facilities rather than new construction.

Transportation Systems Management (TSM) may include intersection signalization where warranted, intersection widening, pedestrian crossing signals, pull-outs for bus stops, additional sidewalks, additional guard rails and landscaping. The transportation systems management actions could also include right-turn-only restrictions, paired one-way side streets, improved signal timing, improved transit service, expanded ridesharing programs (i.e. from the Holbrook Center commuter lot), or the use of the proposed Old Colony Railroad commuter rail project. Any, or all, of the above management actions may be combined with the other five alternatives.

The introductory section for this alternative will provide a description of each of these techniques and how the alternative might be applied to the Route 37.

o Traffic Signals

There are three traffic control signals within the Route 37 corridor. These signals are located at the intersections of Route 37 with Plain and Hancock Streets, Johns Avenue, and Route

139. Additional traffic signal warrants[1] are met for the intersections of Route 37 with Peach Street and South Street. It is possible for the Town of Braintree to pursue traffic signals at these locations.

Available traffic data for the Route 37 - Peach Street intersection reveals that this intersection would meet two traffic signal warrants, those being Warrant 9 - Four Hour Volumes and Warrant 11 - Peak Hour Volume warrants.

The intersection of Route 37 and South Street serves traffic volumes sufficient for Warrant 9 - Four Hour Volumes and Warrant 11 - Peak Hour Volume traffic signal warrants. In addition, for the four hours of data collected for this location (see Figure 4), the intersection meets requirements for a Warrant 1 - Minimum Vehicular Volume traffic signal warrant. Any traffic signals along this corridor should be part of a progressive traffic signal system.

o Pedestrian

Data collection efforts did not include pedestrian volumes along Route 37. Discussions with local officials present at the February 5, 1987 meeting indicate that existing pedestrian

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[1]Traffic signal warrants are based upon traffic conditions and physical characteristics of the intersection. Standards for different traffic signal warrants are set forth in the Manual on Uniform Traffic Control Devices (MUTCD). This manual establishes eleven traffic signal warrants. These are:

Warrant 1 - Minimum vehicular volume.
Warrant 2 - Interruption of continuous traffic.
Warrant 3 - Minimum pedestrian volume.
Warrant 4 - School crossings.
Warrant 5 - Progressive movement.
Warrant 6 - Accident experience.
Warrant 7 - Systems.
Warrant 8 - Combination of warrants.
Warrant 9 - Four hour volumes.
Warrant 10 - Peak hour delay.
Warrant 11 - Peak hour volume.

volumes may be lower than actual demand due to the lack of pedestrian facilities along the highway. Warrant 3 - Minimum Pedestrian Volumes would require a demand of 105-150 pedestrians per hour for eight hours wishing to cross Route 37 to warrant a pedestrian signal. The 105 pedestrian figure is a 70% reduction in demand allowed by the Manual on Uniform Traffic Control Devices for the 40 mile per hour speeds measured on Route 37 (see Table 2).

o Geometric Changes

Intersection widening may improve traffic flow and safety at spot locations. These actions would include adding left and right turn lanes that are separated from through traffic. Such an action could improve gaps in traffic at intersections and decrease delay.

o Additional Transit

Expanding transit service in the Route 37 corridor with more frequent service would provide residents of the Highlands and others with destinations in the Highlands and others with an alternative to automobile travel. Reducing automobile use in the Route 37 corridor could alleviate many of the concerns raised by residents of the Braintree.

o Bus Loading

MBTA transit schedules report approximately 15 minute headways for buses serving the Route 37 corridor. These vehicles must stop in traffic to pick-up and drop-off passengers, blocking vehicles in the outside lane. The provision of bus loading zones along Route 37 would alleviate this problem. These zones are usually 12 feet wide and 100 feet long (see Table 9).

o Sidewalks

Some parts of Route 37 are without sidewalks. In these areas pedestrians walk along the edge of the roadway, or cross Route 37 at mid-block to sidewalks located on the opposite side of Route 37. The most notable area lacking a sidewalk is the railroad bridge north of Peach Street which has a sidewalk only on the east side of the bridge. Pedestrians are forced to cross the highway in order to safely cross the railroad tracks. With the

Table 9

MINIMUM DESIRABLE LENGTHS FOR BUS CURB LOADING ZONES[a]

APPROX. BUS SEATING CAPACITY	APPROX. BUS LENGTH (FT)	LOADING ZONE LENGTH[b] (FT)					
		ONE-BUS STOP			TWO-BUS STOP		
		NEAR SIDE[c]	FAR SIDE[d]	MID-BLOCK	NEAR SIDE[c]	FAR SIDE[d]	MID-BLOCK
30 and less	25	90	65	125	120	90	150
35	30	95	70	130	130	100	160
40-45	35	100	75	135	140	110	170
51-53	40	105	80	140	150	120	180

[a] Source: American Transit Association.
[b] Measured from extension of building line, or from an established stop line, whichever is appropriate. Based on side of bus positioned 1 ft from curb; if bus is as close as 6 in. from curb, 20 ft should be added to near-side stops, 15 ft to far-side stops, and 35 ft to midblock stops.
[c] Increase 15 ft where buses are required to make a right turn. If there is a heavy right-turn movement of other vehicles, near-side stop zone lengths should be increased 30 ft.
[d] Based on roadways 40 ft wide, which enable buses to leave the loading zone without passing over centerline of street. Increase 15 ft if roadway is 36 ft wide, and 30 ft if roadway is 32 ft wide.

Source: Highway Research Board, Highway Capacity Manual 1965 (Washington DC: 1965).

institution of commuter rail service along this line, this would become more critical.

o Guard Rails

Several locations may be considered unsafe due to roadway curvature along Route 37, including the segments between Park Avenue and Brewster Avenue, opposite South Street, and between John's Avenue in Holbrook and South Street in Braintree. In areas such as these guard rails and improved signage warning of road curvature and reduced speeds have proven beneficial.

Right-turn only restrictions could also be considered for some locations along Route 37. A typical four-leg intersection of a two-lane road with a four-lane highway contains 36 potential diverging, merging and crossing conflicts (see Figure 5), a "T" intersection contains eleven such conflicts[2]. Turn restrictions can reduce these to four conflicts at a four-leg intersection and two conflicts at a "T" intersection. However provisions for U-turns along the route would be needed to serve the other movements.

o Street Pairs

Paired one-way streets can also provide for a reduction in turning conflicts. A one-way street pair at a "T" intersection reduces conflict points from eleven to four.

o Signal Timing

Signal timing may often be altered to improve traffic flow. In addition to serving the maximum flow of traffic, signal timing can be used to coordinate flow between intersections to maintain a constant safe speed through the corridor.

o Additional Transit

Expanding transit service in the Route 37 corridor with more frequent service would provide residents of the Highlands and

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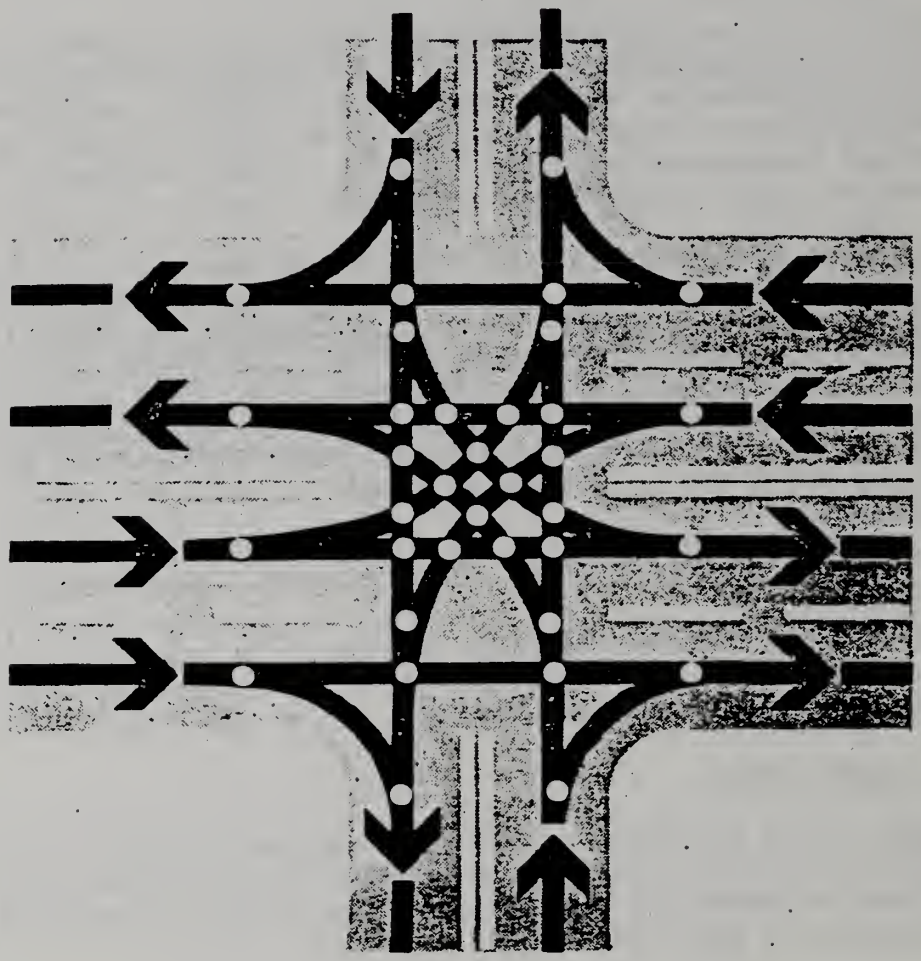
[2]Colorado Department of Highways, Colorado Access Control Demonstration Project, June 1985.

Figure 5

Intersection Conflict Points



This diagram illustrates the location of the 36 conflict points in a four-lane intersection. It is a total of potential diverging, merging, and crossing conflicts.

Source: Colorado Department of Highways, Colorado Access Control Demonstration Project, June 1985.

others with an alternative to automobile travel. Reducing autobmobile use in the Route 37 corridor could alleviate many of the concerns raised by residents of the Braintree Highlands. Expanded ridesharing and the proposed Old Colony Railroad commuter rail project are two additional ways automobile traffic can be reduced in the Route 37 corridor.

The advantages/disadvantages sections shall discuss the key aspects of the TSM activities that could have a measurable impact on conditions along Route 37.

Transportation Systems Management provides a number of options to be considered to address specific concerns along Route 37. The options include capacity (signal timing, additional signals, geometric changes) as well as safety (pedestrian facilities, guard rails, street pairs) improvements that oculd be pursued for the road.

TSM provides low cost, effective methods to address the dual role of the road, local and regional access.

2) Capacity and Delay

Intersection signalization, improved signal timing and intersection widening are all primarily capacity related improvements. The intent is to make the most efficient use of the intersection. Table 10 compares existing levels of service and delay for the four intersections with what could be anticipated with signal optimization and geometric changes at the signalized locations. Table 11 provides level of service and delay data for signalizing the Peach and South Street intersections. Table 11 also provides level of service and delay information for signalizing these two intersections while either widening Route 37 to accommodate four 12 foot lanes or reducing the roadway to one lane in each direction.

As can be seen in Table 10, signal optimization will have a minimal impact on intersection conditions. Improvements to operating conditions will occur only in the morning peak hours at the two currently signalized locations.

Geometric changes would improve level of service at the Route 37 - Route 139 intersection (Table 10). Geometric changes would not improve conditions at the Route 37-Hancock Street-Plain Street intersection.

Signalization of the Peach Street and South Street intersections will improve the level of service at these two intersections over the unsignalized conditions (Table 11). This improvement would be present under all of the studied roadway width alternatives. As illustrated in Table 12, additional intersection traffic signals will have no significant impact on the level of service or average speeds experienced on the segments connecting the primary intersections.

3) Safety

The intersection signalization and widening discussed above, would also enhance safety. Signals at the Peach Street and South Street would create gaps in traffic on Route 37 to allow vehicles to safely enter from side streets. A corresponding reduction in angle-type accidents should result.

The provision of additional sidewalks and pedestrian signals, if warranted, would improve pedestrian safety along Route 37. As discussed, if sidewalks were provided on both sides of Route 37 throughout the study area, fewer pedestrian/vehicle conflicts would result.

The accident data from Braintree and Holbrook Police departments identify 52 accidents where vehicles hit objects off of the roadway. Most, if not all, of these accidents occurred in areas or curved road segments. In these areas, guard rails would enhance the safety of residents along Route 37.

Turn restrictions and one-way street pairs reduce the number of turning movements occurring at particular locations. These actions result in drivers needing to concentrate on fewer potential conflict points and actions should, therefore, lead to a reduction in accidents.

Table 10
TRANSPORTATION SYSTEM MANAGEMENT-SIGNAL OPTIMIZATION AND GEOMETRIC CHANGES

Intersection Analysis, AM Peak Hour
Level of Service (Delay)

Intersection	Movement	Existing	Optimum[1] Signal	TSM Geometric[2] Changes
Rt. 37/Hancock/Plain	Overall	C(23.5)	C(20.5)	na
Rt. 37/Peach	SB Left	C(14.5)	na*	na
	Peach WB	F(Inf)	na	na
Rt. 37/South	NB Left	A(5.2)	na	na
	EB Left	F(Inf)	na	na
	EB Right	A(4.1)	na	na
Rt. 37/Rt. 139	Overall	E(53.8)	D(30.4)	C(15.3)[3]

Intersection Analysis, PM Peak Hour
Level of Service (Delay)

Intersection	Movement	Existing	Optimum Signal	TSM Geometric Changes
Rt. 37/Hancock Plain	Overall	D(39.6)	D(39.6)	E(41.7)
Rt. 37/Peach	SB Left	B(9.2)	na	na
	Peach WB	F(Inf)	na	na
Rt. 37/South	NB Left	C(13.2)	na	na
	EB Left	F(Inf)	na	na
	EB Right	A(7.0)	na	na
Rt. 37/Rt. 139	Overall	F(Inf)	na	C(15.4)[3]

1 NA means not applicable to the conditions at this intersection.
2 Geometric changes for conditions at unsignalized intersections were not considered.
3 Route 37 approaches are two general purpose lanes. Route 139 eastbound consists of two general purpose lanes. Route 139 westbound consists of

two lanes, one for left-turns only.

Table 11
Intersection Analysis for Potential Signalization

Intersection	Existing[1] Geometry LOS	(Delay)	Two 12 foot Lanes[2] LOS	(Delay)	One 12 Foot Lane[2] Lanes[2] LOS	(Delay)
Rt. 37/Peach	B	(7.8)	A	(4.6)	D	(26.6)
Rt. 37/South	B	(5.5)	B	(5.5)	B	(9.5)

Intersection	Existing[1] Geometry LOS	(Delay)	Two 12 foot Lanes[1] LOS	(Delay)	One 12 foot Lane[2] LOS	(Delay)
Rt. 37/Peach	B	(6.3)	A	(3.6)	B	(11.9)
Rt. 37/South	B	(6.3)	B	(6.0)	B	(11.3)

[1] Route 37 approaches are two general purpose lanes.
[2] Route 37 approaches include left and right turn storage lanes as well as the single travel lane.

Table 12

Arterial Analysis for Additional Signalization (Northbound)

AM Peak Hour

Segment	Existing[1] LOS	(Speed)	Signals[2] LOS	(Speed)
Plain to Peach	A	(37)	A	(36)
Peach to South	A	(38)	A	(37)
South to Johns Ave.	A	(37)	A	(37)
Johns Ave. to Rt. 139	B	(31)	B	(31)
Overall	A	(35)	B	(35)
Summary[3]	5.31		5.36	

PM Peak Hour

Segment	Existing[1] LOS	(Speed)	Signals[2] LOS	(Speed)
Plain to Peach	B	(33)	B	(34)
Peach to South	A	(38)	A	(36)
South to Johns Ave.	A	(35)	A	(35)
Johns Ave. to Rt. 139	F	(10)	F	(10)
Overall	C	(22)	C	(22)
Summary[3]	8.41		8.43	

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[1] Existing intersection geometry, signal phasing and timing.
[2] Optimal signal timing at Peach and South Streets. Remaining intersections utilize existing geometry, signal phasing and timing.
[3] Average running time to travel the corridor.

Table 12 (Continued)
Arterial Analysis for Additional Signalization (Southbound)
AM Peak Hour

Arterial Analysis

Segment	Existing[1] LOS	(Speed)	Signals[2] LOS	(Speed)
Rt. 139 to Johns	A	(36)	A	(36)
Johns to South	A	(37)	A	(36)
South to Peach	A	(38)	B	(35)
Peach to Plain	C	(27)	C	(27)
Overall Summary[3]	B	(34)	B	(33)
	5.53		5.68	

PM Peak Hour

Segment	Existing[1] LOS	(Speed)	Signals[2] LOS	(Speed)
Rt. 139 to Johns	A	(35)	A	(35)
Johns to South	A	(37)	A	(35)
South to Peach	A	(38)	A	(38)
Peach to Plain	E	(16)	E	(16)
Overall Summary	B	(29)	B	(28)
Summary	6.58		6.61	

[1] Existing intersection geometry, signal phasing and timing.
[2] Optimal signal timing at Peach and South Streets. Remaining intersections utilize existing geometry, signal phasing and timing.
[3] Average running time to travel the corridor.

TSM measures do not include capital intensive projects. This excludes reconstruction of the railroad bridge north on Route 37 north of Peach Sreet.

This bridge provides marginal sight distance for the posted speed limit. Fast moving vehicles on Route 37, coupled with a vehicle queue at a a traffic signal at the Peach Street intersection may increase safety problems at this intersection. Signal design for this intersection should consider these sight distance factors.

4) Traffic Diversions

Any improvements along Route 37 might draw traffic from surrounding streets.

5) Environmental Quality

TSM measures which reduce delay within the corridor would consequently improve air quality in the corridor.

6) Quality of Life

Improvements in the safety of residents of the corridor, without increasing congestion, would have positive impact on living conditions in the Braintree Highlands. The TSM measures discussed above would provide residents with safer access to Route 37, provide some protection for pedestrians, and provide additional protection to front yards and homes.

Several of the TSM strategies discussed above would require land takings in order to be accomplished (eg: intersection widening and the creation of bus turn-outs). At these locations, abutting property owners might find these measures undesirable. Guard rails are not considered to be attractive and may give the area the impression of a speedway. Landscaping should be considered in conjunction with guard rails.

7) Feasibility

TSM provides a number of measures that could be applied to Route 37 to possibly improve upon the existing situation. Within this list of actions local officials and the Massachusetts Department of Public Works may find agreement on enough actions to make a difference in the conditions of concern in the corridor.

These actions include:

- o intersection signalization;
- o intersection widening;
- o pedestrian crossing signals;
- o pull-outs for bus stops;
- o additional sidewalks;
- o additional guard rails;
- o turn restrictions;
- o paired one-way side streets;
- o improved signal timing;
- o expanded transit service; and
- o expanded ridesharing.

The Transportation Improvement Program for the Boston region is oversubscribed with highway projects. Projects added to this list sometimes face long delays before implementation. The towns of Braintree and Holbrook should join together to prioritize and lobby for any projects that will be pursued along Route 37.

G. Narrow the Roadway and Reduce Lanes

1) Summary

At a February 5, 1987 meeting the Task Force requested that the study include an analysis of narrowing Route 37 and reducing the number of lanes: removing pavement to create a standard two lane cross-section.

In general this alternative would have similar impacts as the restriping Route 37 for two lanes. The main differences are the increase in the actual distance between Route 37 and nearby homes, and the reduction in shoulder space which may otherwise be used for passing slower vehicles.

A reduction to two lanes on Route 37 will result in a level of

service "E/F" on the highway. This will mean a doubling of hydrocarbon and carbon monoxide emissions in the area.

A lane reduction would reduce peak hour vehicle speeds to less than 20 miles per hour. These conditions would tend to reduce speed related accidents but could increase other types of accidents, i.e. rear-end or angle accidents. A lane reduction would not address inherent roadway curvature problems.

2) Capacity and Delay

This alternative would reduce the capacity of Route 37, in essence having the same impacts discussed above for the restriping of Route 37 to Two Lanes. It would also reduce vehicle speeds and Level of Service from a "C" to "E" or "F".

This alternative would also result in increased delay for traffic entering from side streets and driveways (see Table 6). Very few gaps would be sufficient for safe entry to the traffic stream.

3) Safety

The safety advantages for this alternative are the same as for restriping the roadway to two lanes. Specifically the reduction in lanes could lead to a reduction in speed related accidents in the corridor.

The narrowing of the pavement would provide one advantage, from a safety perspective, over simply restriping Route 37: restricting shoulder space would preclude the use of the shoulder during peak periods as a travel lane.

An increase in intersection-related accidents would be expected, due to the lack of adequate gaps in traffic for vehicles to enter and exit the vehicle stream.

4) Traffic Diversions

This alternative, removing pavement and restriping for two lanes, will have the same traffic diversion impacts as described above under the restriping of Route 37 to Two Lanes. These impacts include diversion of traffic to Liberty Street and other residential roadways parallel to route 37 and additional traffic on residential streets linking these roads.

5) Environmental Quality

Increases in delay on Routre 37 would all indicate increased emissionsof air pollutants and a significant impact on air quality in the area of Route 37 and alternate routes. Narrowing the roadway will double the emissions of air pollutants (Table 7). In general it can be assumed that roadway narrowing on Route 37 will diminish air quality well beyond the corridor itself.

6) Quality of Life

Physical removal of pavement from along Route 37 throughout the Braintree Highlands would increase the separation between traffic and adjacent homes; increasing the "sense of safety" for people using front yards or walking along the highway.

Residents along Route 37 and alternate routes would experience increased congestion noise and exhaust fumes in these areas. The roadway narrowing alternative would have a negative impact on residents in the Highlands as well as in other neighborhoods.

7) Feasibility

The Massachusetts Department of Public Works is not likely to support an alternative which will impair mobility and increase emissions. In addition, federal funds would not be made available for this, given the air quality impacts. Local officials will also need to be responsive to the concerns of those in other neighborhoods who would be affected.

H. Divide Route 37 With Barriers

1) Summary

A second addition made to the list of alternatives at the February 5, 1987 meeting was the consideration of dividing Route 37 with a raised median. While this alternative could be considered to be a Transportation Systems Management (TSM) strategy, it deserves individual attention.

A divided highway could be pursued with either a two-lane or a four-lane cross-section if approved by MDPW and the Federal Highway Administration. Whichever of these cross-sections that is chosen would experience traffic conditions similar to those discussed above under the analyses of the two and four lane alternatives.

A raised median on Route 37 could be used to control and limit turning movements on the road. Such an aciton could improve capacity and safety in the corridor. The use of a raised median will have to allow for U-turns at some locations. Additional capacity improvements will be needed at these locations. Specific design considerations will need the agreement of the Federal Highway Administration.

2) Capacity and Delay

A median, whether applied to a two-lane or four-lane cross-section, will improve traffic flow, over those conditions that would be present under corresponding two and four lane configurations. This improvement in traffic flow on segments would be directly attributable to the center barrier.

At median breaks additional TSM measures would be necessary to provide for U-turns.

A divided highway along Route 37 would add to the total number of vehicles passing a given point each day. This would occur due to travel beyond the destination to reach a median break. The increase in total traffic may outweigh any benefits from dividing the highway.

3) Safety

A raised median along Route 37 could reduce accidents along Route 37 if, in the process, lane widths are not reduced. The median would eliminate left-turning traffic along Route 37 except at designated locations. This would eliminate vehicles stopping at mid-block to turn and vehicles turning left into the traffic stream, resulting in fewer conflicting movements of traffic.

To divide the highway without additional intersection treatments would result in safety problems at most median breaks, given the consolidation of turns at the intersections. The divided highway might also experience higher vehicle speeds than the corresponding undivided highway alternative.

4) Traffic Diversions

A divided highway will lead to some minor diversion of traffic to adjacent streets even under ideal conditions. This diversion will result from people wishing to avoid the need to bypass their destination or to initally drive in the opposite direction of their destination. However, if the division of the highway includes additional TSM measures at intersections the diversions should not be significantly more than would be anticipated for corresponding two or four lane configurations that are not divided.

If no additional TSM measures are undertaken major traffic diversions should be anticipated.

5) Environmental Quality

Traffic flow improvements along corridor segments should improve air quality on Route 37 when compared to the corresponding undivided highway alternatives.

A divided highway will have negative consequences for the Route 37 corridor if no intersection related TSM is included.

6) Quality of Life

Residents along Route 37 will experience longer trips to their destinations with a divided highway. This will result from their being restricted to right-turns into and out of their driveways. Depending upon the location of a residence these diversions could be significant.

Quality of life could also be adversely affected if the highway division does not include additional TSM measures at intersections. Without these measures, residents will be forced to live with increased traffic, noise and exhaust fumes.

7) Feasibility

In order to implement a divided highway, local officials and the Massachusetts Department of Public Works will need to come to an agreement that this is a desirable alternative. Decisions will need to be made between selecting a two or four lane cross-section which could be controversial for both parties. If a raised median and lane configuration can be agreed upon then resident support will be needed for restricting access to their properties.

I. Place Barriers Between Route 37 and Sidewalks

This alternative, raised at the February 5, 1987 meeting, is a Transportation Systems Management Strategy and has been addressed above under the discussion of such strategies as an alternative.

J. Summary

The Route 37 study provides a discussion of the advantages and disadvantages associated with nine possible alternatives for addressing traffic and safety concerns raised by residents of Braintree and Holbrook. Tables 13 through 18 summarize the keypoints raised in the preceding discussion.

Table 13
Summary of Capacity & Delay Impacts

Alternative	Advantages	Disadvantages
1. No Change	o Route 37 operates at acceptable levels of service.	o Access from side streets and driveways is difficult.
2. Widen to Four Lanes	o Increased capacity/ improved traffic flow.	o Access to Route 37 from driveways would still be difficult.
3. Restripe to Two Lanes		o Decreased roadway capacity; o Increased delay.
4. Restripe to Three Lanes	o Removes left-turning traffic from through lanes. o Compromise with respect to capacity.	o Increased congestion. o Reduced through-traffi capacity.
5. Bypass	o "Outer-Belt" would alleviate traffic on Route 37; o "Inner-Belt" reduces traffic only from Peach Street north.	o Outer-Belt has limited capacity.
6. Narrow to two Lanes		o Reduced capacity o Increased delay
	ADD ONS	
A. Transportation Systems Management	o Alleviation of bottlenecks	
B. Centerline Median	o Improves segment flow due to fewer conflicts;	o Increased trip difference

C. Barriers Between Roadway & Lawns	This option, raised at the February 5, 1987 meeting, is a Transportation Systems Management Strategy and is addressed above under the discussion of such strategies as an alternative.

Table 14
Summary of Safety Impacts

Alternative	Advantages	Disadvantages
1. No Change		o No improvement in safety.
2. Widen to Four Lanes	o Provides lateral clearance; o May likely reduce roadway curvature.	o Increased vehicle speeds possible.
3. Restripe to Two Lanes	o May reduce peak period speeds; o Would reduce variations in vehicle speeds;	o Shorter gaps to enter and exit traffic flow, o Shoulders used as travel lanes.
4. Restripe to Three Lanes	o "Safe" area created for left turns.	o Potential for head-conflicts in median lane. o Lane may be used as an acceleration or passing lane
5. Bypass	o Less traffic on Route 37 reduces opportunity for accidents.	o Roadway curvature and sight distance on Route 37 unchang
6. Narrow to Two Lanes	o Fewer speed related accidents	o Fewer safe gaps for traffic entering Route 37
	ADD ONS	
A. Transportation Systems Management	o Increase gaps in traffic for access to Route 37 o Improved pedestrian facilities (sidewalks, guard rails) o Fewer conflict points	o Route 37 Railroad Bridge still a problem (sight distance).

B.	Center line Median or Barrier	o Reduces conflict points	o Busier intersections
C.	Barriers Between Roadway & Sidewalks & Lawns	This option, raised at the February 5, 1987 meeting, is a Transportation Systems Management Strategy and is addressed above under the discussion of such strategies as an alternative.	

Table 15
Summary of Traffic Diversions

Alternatives	Advantages	Disadvantages
1. No Change		o Increasing diversions due to "Unsafe" Conditions
2. Widen to Four Lanes	o Remove traffic from nearby residential streets.	o May draw traffic from alternate routes.
3. Restripe to to Two Lanes		o Traffic diversions to adjacent streets
4. Restripe to Three Lanes	o Compromise between two lanes and four lanes	o Lost capacity would cause traffic diversion to alternate
5. Bypass	o Substantial traffic removed from Route 37	o Traffic Diversion to another residential corridor
6. Narrow to Two Lanes		o Traffic Diversions to alternate routes
	ADD ONS	
A. Transportation Systems Management	o Remove some traffic from Residential Streets	
B. Centerline Median or Barrier		o Traffic Diversions due to limited median breaks.
C. Barriers Between Route 37 & Sidewalks	This option, raised at the February 5, 1987 meeting, is a Transportation Systems Management Strategy and is addressed above	

& Lawns	under the discussion of such strategies as an alternative.

Table 16
Summary of Environmental Quality Impacts

	Advantages	Disadvantages
1. No Change		o Air quality problems may develop at existing lane drops.
2. Widen to Accommodate Four Lanes.	o Improved traffic flow would result in improved air quality	o Increases in traffic in the corridor would bring added emissions.
3. Restripe to Two Lanes.		o Increases in delay result in added emissions.
4. Restripe to Three Lanes.		o Increases in delay will result in added emissions
5. Bypass	o Removing traffic and emissions from Route 37	o Decrease in air quality along Liberty o Lost Wetlands
6. Narrow the Roadway to Two Reduce Lanes	o New green space Reduced run-off	o Decreases air quality in corridor and in neighborhoods
	ADD ONS	
A. Transportation Systems Management	o Decreases in delay in the corridor will mean reduced emissions.	

B.	Centerline median or Barrier	o Traffic flow improvements would benefit air quality	o Longer trips mean added emissions
C.	Barriers Between Roadway & Sidewalks & Lawns	This option raised at the February 5, 1987 meeting, is a Transportation Systems Management Strategy and is addressed above under the discussion of such strategies as an alternative.	

Table 17
Summary of Quality of Life Impacts

1. No Change	o No Disruption	o Does not address issues raised by residents.
2. Widen to Four Lanes	o Greater mobility	o Highway closer to homes o Higher vehicle speeds
3. Restripe to Two Lanes	o Traffic further from houses o Increase opportunity to enforce speed limit	o Increased congestion in neighborhoods Increased exhaust fumes.
4. Restripe to Three Lanes	o Slows down traffic o Separates turns	o Increased congestion on Route 37 and in neighborhoods o Increased exhaust fumes.
5. Bypass	o Less traffic on Route 37	o Added traffic on Bypass route
6. Narrow to Two Lanes	o Roadway further from homes	o Increased congestion on Route 37 and in neighborhoods Increased noise. Increased fumes.
	ADD ONS	
A. Transportation Systems Management	o Improved safety for residents and pedestrians	o Spot widening at intersections will

		infringe on abutting property.
B. Centerline Median or Barrier		o Longer trip lengths o Increased congestion in neighborhoods o Reduced access to property.
C. Barriers between Roadway & Sidewalks and Lawns	This alternative, raised at the February 5, 1987 meeting, is a Transportation Systems Management Strategy and is addressed above under the discussion of such strategies as an alternative.	

Table 18
Summary of Feasibility Impacts

	Advantages	Disadvantages
1. No Change		o Already in place
2. Widen to Four Lanes		o Financing is not available. o Extensive land takings make this an unpopular alternative.
3. Restripe to Two Lanes	o Low Cost	o Not consistent with MDPW need to maintain regional mobility. o Not consistent with Braintree master plans.
4. Restripe to Three Lanes	o Low cost	o Not consistent with MDPW need to maintain regional mobility. Not consistent with Braintree master plans.
5. Bypass		o Large expenditure of funds o Wetlands construction o Land takings
6. Narrow and Reduce Lanes	o New green space would make this a popular alternative	o Not consistent with MDPW need to maintain o Not likely to be funded due to air quality effects.
	ADD ONS	
A. Transportation Systems	o Many options o Most are low-cost	

Management	measures.	
B. Centerline Median or Barrier	o Minimum width of 40' required	o Financing o Would require U-Turn construction. o Available 40' width is marginal.
C. Barriers Between Roadway and Sidewalks and Lawns	This option, raised at the February 5, 1987 meeting, is a Transportation Systems Management Strategy and is addressed above under the discussion of such strategies as an alternative.	

VII

GROWTH MANAGEMENT MEASURES

The preceding analysis illustrates that accommodating traffic in the Route 37 corridor will be a challenge. Additional traffic, due to residential and/or commercial growth, will further aggravate the situation on Route 37. It is appropriate to consider, at this point, limiting or restructuring future growth in some way. This section of the report offers several strategies which may be useful to Braintree and Holbrook in planning for development which could add traffic to Route 37 and other facilities.

Downzoning

The most direct method of capping development in the corridor is to remove remaining undeveloped or lightly developed land from consideration for future development by changing its zoning so as to exclude high concentrations of traffic generating activity. For example, suppose a lot is rezoned from 'general business' to 'light industrial', thus disallowing retail uses. Where previously a shopping center would have been permitted, which would have generated 50-80 trips per thousand square feet per day, now the site would be the destination primarily for employees rather than shoppers and would generate on the order of 6-10 trips per thousand square feet per day. The timing of the traffic would also be different: peaks would come around 9:00 A.M. and 5:00 P.M., and weekend traffic would be negligible (while retail uses draw their biggest crowds on Saturday). The difference between the peaking characteristics of work- and shopping-related traffic suggests that the town might profit by zoning the corridor so as to encourage a mix of retail and industrial uses.

Planned Unit Developments (PUDs)

One way to incorporate the concept of mixed uses into the zoning bylaw is through a planned or mixed use unit development provision. Planned unit developments (PUDs) are a zoning device which permits flexibility in the distribution of development, without abandoning the basic regulation of total intensity of land use which zoning affords. Relatively intense development surrounded by open space is often more desirable than uniform densities, both from the point of view of the community, which saves on infrastructure investment, and from the point of view of the resident or property owner, who benefits from a more efficient, urbane and well-designed environment and from the amenity of open space. For this reason, PUDs have emerged as a popular tool for development control.

PUDs can also be used to provide developers a mechanism for mixing uses which zoning regulations otherwise would keep separate. PUDs are specifically permitted by G.L. ch. 40A, s. 9, which defines them as mixed-use development on a plot of land containing at least the lesser of 60,000 square feet or five times the minimum lot size of the zoning district. PUDs may contain residential, open space, commercial industrial or other uses, and a variety of building types are permitted by special permit.

PUDs do not function to control the amount of growth or to direct its location, except within a relatively small area. They can be useful tools, however, in the amelioration of design and in minimizing the impact of new development on existing traffic and utilities. A PUD which incorporated residential and commercial uses on a single site could work to reduce the travel needs of its occupants if the retail opportunities it contained were suited to their everyday needs. This is an important "if", because mixing residences with commercial activity geared for a regional market - boutiques and sporting goods stores, for instance, as opposed to dry cleaners and drug stores - will serve no traffic-mitigation purpose. The PUD provision can prescribe that the type of retail activity be declared in the site plan submitted for the planning board's approval.

Transfer of Development Rights (TDR)

Another type of flexible zoning technique, which has been tried with some success in Massachusetts, is transfer of development rights (TDR). The principle of TDR rests on the idea that ownership of land actually consists of a "bundle of rights" with regard to that land. Most TDR programs begin with the designation of two different types of zones (not related to the zones used in land use zoning): "preservation" or "sending" zones, which comprise the areas in which development is to be limited; and "transfer" or "receiving" zones, which are those areas into which growth is to be channeled. In the sending zones, development rights are assigned to property which will be available for purchase and transfer to the receiving zones, but not for use within the sending zones. These development rights are valuable within the receiving zones because they empower the holder to develop his or her land more intensely than the zoning would otherwise allow. Thus landowners in sensitive areas are limited in their ability to develop their land; but they are compensated for their loss with rights which are valuable to developers in other, less sensitive areas.

In Massachusetts, TDR has been implemented in at least two communities, Bedford and Concord. As part of their Planned Residential Development

(PRD) ordinances, those towns specify that "the density of the PRD tract may be increased by conveying to the town, or restricting for the benefit of the town, land which is not within the PRD tract." In this instance, the TDR approach is not mandatory or tied to a reduction in use of a certain parcel. It is an optional approach under which landowners may choose to restrict development of land in one area (generally land which is difficult to develop) in favor of development bonuses on other land.

The allocation of development rights raises the spectre of uncompensated taking if a parcel is given rights whose value is far below that of the land if it were developed to its full market potential. The appropriateness of the number and value of the development rights awarded depends upon the skill and the integrity with which the TDR program is designed and administered. In any case, the passage of a TDR ordinance or bylaw may be followed by a period of litigation as property owners adjust to, and contest, the community's estimation of the development value of their land.

There are also questions about how, and if, transactions in development rights would be taxed; whether the imposition of restrictions constitutes a "taking" requiring compensation; how foreclosure on development rights would be handled; how liens against development rights would be recorded; and how development rights differ from easements.

A question arises as to the costs of development rights transfer. If a market in development rights develops which accurately communicates the values of those rights, there is no cost to developers, purchasers or the community as a whole, because developers receive and purchasers pay exactly what the development rights are worth. It is possible that the owners of property adjacent to the receiving zone will pay because they must endure larger structures than would otherwise be permitted within their zoning district, and because their property may be devalued accordingly. On the other hand adjacent owners may benefit from the larger building and activities depending on the circumstances. In addition to this cost, there is the cost of administering the TDR program.

TDR can be a valuable means of preserving open space, historical properties, and ecologically fragile land without subjecting their owners to "wipeouts". It can also channel growth, away from prime agricultural land and open space and overdeveloped areas, and toward areas with sufficient infrastructure.

One drawback of TDR is that it is new; development rights are a new type of property whose value is difficult to perceive. Commentators on TDR mention the likelihood that a fluid market in development rights may be

hard to create, given that there is not at present any marketplace, such as there is, for example, in real estate itself.

The difficulty of accurately and equitably assigning development rights has already been discussed. There is no single yardstick for the valuation of development rights. Rights cannot be assigned proportionally to acreage owned, because the land within a sending zone will always vary in value according to locational and other characteristics. A plan for creating TDR in South Kingston, Rhode Island resorted to assessing the difference between market value and use value in each parcel. While this is an equitable solution, it presents considerable difficulties in assessing actual and potential property values.

Impact Fees

Developer exactions or impact fees provide for payment or work by the developer to compensate the community for part of the added cost incurred as a result of new development. This is important in Massachusetts, where Proposition 2 1/2 generally does not allow such added costs to be met directly by increased taxes on such developments. Because impact fees are a new tool, they involve legal, technical, and attitudinal obstacles which in this Commonwealth are greater than in many "younger", more flexible and adaptable states. (In California, Colorado, Florida, Montana, Nevada, New York, Maryland, Utah, and Wisconsin impact fees or fees in lieu of land dedication have been upheld by courts or have been expressly authorized by statute.)

While developers are frequently asked to contribute off-site improvements in Massachusetts, there are no standards, uniformity, or accepted rationale for the exactions; and the requests may range from a reasonable and truly voluntary contribution to an excessive and unjustified, illegal demand.

It is important that exactions be imposed equitably on all developers, and that they be proportional to the impacts which developments will have on the community.

In general, impact fees should be applied to the capital costs of expanded facilities, operating, maintenance, and replacement costs, should be funded by the current tax levy.

When challenged in court, developer exactions have been subjected to certain tests. The fees imposed must have a rational and direct connection, or "nexus" as the lawyers call it, to the particular development. It is necessary to be able to show that the fees will be

used to benefit the development and not the community generally. The level of fees must not exceed the added costs imposed by the particular development and must not include operating or maintenance costs or any cost paid out of another source or imposed on all residents, including the residents of the new development. There should be a provision for a variance or an appeal, where due to specific circumstances the regular fees would not be equitable. Finally, unless they can be passed on to state or federal government, fees ought to be waived for developments for low or moderate income people.

In Massachusetts, as in most states except California, cities and towns can only impose taxes as expressly authorized by the legislature, while fees (either user fees or regulatory fees) may be imposed by communities. It is, therefore, important to define the charges imposed on the developer to pay for the added costs caused by development in a way that courts will classify as fees. This means, for instance, that they should be based on the benefit to the occupants of the new development and not on the value or size of the development.

It is generally accepted that the developer must provide or pay for improvements within the development. In many states, but not in Massachusetts, this includes the dedication land within the development for parks, and in some cases for other purposes, or the payment of fee in lieu of such dedication. From there, several levels of developer exactions may be visualized, either imposed as specific conditions of a special permit in a particular case or applying uniformly to all developments of certain size or type under a bylaw that should include:

- filing fee for engineering review;
- the cost of special studies (e.g., traffic);
- extending (connecting) roads for some distance outside the development;
- enlarging or improving transportation facilities or utilities a considerable distance outside the development.

The developer may do the work, pay somebody else to do it, or pay its proportionate share of the cost of a facility intended to meet the increased demand due to several new developments over time. If a developer contributes its share of the cost, it is essential that the money be held separately for its intended use, such as by setting up an assessment district or an escrow account, and not be co-mingled with money for other purposes, even if it is for the same development. If money is left over after the cost of the expanded facility has been met, it may have to be refunded. Since costs change over time, some jurisdictions

recalculate the fees annually, based on the theoretical current replacement cost of the new or expanded facility.

The fees must be based on reasonable planning and construction standards which, ideally, should be defined in the master plan. In any event the fee schedule needs to be substantiated and consistent for all developments. Residential, commercial, industrial, and institutional fees may be based on different criteria (households, residents, floor area, acres, trips generated). If called upon, the town should be able to substantiate the costs of meeting the established performance standards and the developer's share of the cost of needed facilities. This requires a sophisticated and thorough process, using well-qualified professionals, detailed records and accounts. See Appendix B for a sample development impact standard from Framingham's zoning code.

Because of the relatively large number of independent projects that take place within the Route 37 corridor, the application of developer exactions there would require a very well-drafted bylaw. All of the issues raised above of equity, attribution of impacts to specific projects, and relevance of exaction to impact are critical in apportioning responsibility for improvements fairly among developers. If these problems can be solved, however, developer exactions can be a valuable element of the town's growth management strategy. As development continues and traffic impacts accrue, needed improvements to Route 37 could be made, even if MDPW funds were not immediately available.

VIII

RECOMMENDATIONS

This study has explored a variety of alternatives. Each of these alternatives has associated advantages and disadvantages, described in Section VI of this study. The following recommendations, address some of the most important issues raised by the task force, and by the prospect of growth of the area.

It is important to note that these recommendations include a number of elements. Some will need additional study to determine whether they would achieve the desired improvement. Others follow directly from this analysis and are recommended to MDPW and local officials for their consideration.

A. Intersection Signalization

1) The existing traffic signals located on Route 37 at Plain Street, John's Avenue and Route 139 should be optimized to provide for the best flow of traffic on Route 37. When the signals are optimized MDPW should also determine whether there is a need for a pedestrian phase (see Recommendation C. 2.).

2) The existing traffic signals and any new traffic signals should be coordinated in a progressive traffic signal system. The system also be coordinated with other signals along Franklin and Hancock Streets in Braintree outside of this study area.

3) The intersections of Route 37 with Peach and South Streets should be signalized to provide adequate gaps for vehicles to enter the flow of traffic on Route 37 from Peach and South Streets safely and efficiently. Signals at these locations will meet signal warrants as determined by the Manual on Uniform Traffic Control Devices and available traffic data. These signals should improve safety and reduce delays for traffic on Peach and South Streets.

B. Widening

1) The intersection of Route 37 and Route 139 in Holbrook needs to be widened: two lanes on each approach to accommodate turning movements. The analysis suggests two general purpose lanes on Route 37 approaches (north- and southbound), two general

purpose lanes on Route 139 eastbound and two lanes on Route 139 westbound - one for left turns only and one for through and right turning traffic.

2) The Massachusetts Department of Public Works should determine the feasibility of widening from the Braintree/Holbrook Town Line south to Route 139 expanding the present two-lane configuration to four-lanes. This area is currently congested with a level of service "F" on this segment during the p.m. peak hour. The Holbrook Planning Board has stated:

> "If any section of the roadway can be feasibly widened and/or straightened in any part of the area, it will improve the road's ability to handle the loads that it presently has and will, in the future, have." (Letter to MAPC of March 16, 1987)

3) Further study is recommended to explore the possibility of restricting turning movements along Route 37 between South Street and Park Avenue. Dangerous conflicts could be reduced through the selective elimination of some access points, turn restrictions, one-way street pairs, or dividing Route 37 with a raised median. These measures appear to be necessary due to the curvature of the roadway in this area and limited gaps in the traffic stream.

C. Pedestrian Facilities

1) Sidewalks should be constructed along both sides of Route 37 in order to provide for pedestrian safety and comfort. These sidewalks could be constructed through the use of a benefit assessment procedure as outlined in Mass. General Law 83 Section 26.

2) A pedestrian demand study should be undertaken as a part of any new or improved traffic signal system to determine the need for pedestrian actuated signals along Route 37. If this pedestrian demand study determines that pedestrian phasing is warranted at these traffic signals they should be included in the signal design.

D. Increasing Vehicle Occupancy

1) Promotional efforts should be undertaken by the MBTA, Braintree and Holbrook officials, local employers, and local businesses

to increase the use of public transportation.

2) Local employers should be encouraged or required to increase employee ridesharing.

3) The MBTA should study the possibility of increasing bus service along Route 37. This study could include the possiblity of increased public and/or private feeder service along Route 37 to the Braintree Red Line Station.

E. Growth Management

1) The towns of Braintree and Holbrook should consider growth management strategies described in Section VII of this report with the goal of limiting or restructuring future growth so as to reduce traffic demand for single occupant vehicles. It is especially important that the towns require future development along Route 37 to anticipate impacts on the roadway and to provide mitigating measures.

F. Other

1) A major concern is the vertical alignment of the Route 37 bridge over the railroad (north of Peach Street). Limited sight distance of this bridge will compromise any improvements at the Peach Street intersection. The bridge should be studied and scheduled for improvement at the earliest possible time. In the interim, if the Peach Street intersection is signalized, some form of early warning should be provided to motorists approaching the intersection from the north.

2) Park Avenue provides direct access between Route 37 and Liberty Street. This street may serve trips with travel characteristices similar to that of Peach Street. This means that the intersection of Park Avenue and Route 37 is a potential capacity problem. Further study should be undertaken to determine signal warrants and operating conditions.

IX

Addendum

The Braintree Highlands Civic Association Route 37 Study Committee reviewed the materials presented to the Route 37 Task Force on April 30, 1987. These materials included the capacity analyses found in Tables 2, 3, 5, 6, 10, 11, and 12, air quality analysis found in Table 7 and the discussion of advantages and disadvantages found in Tables 13 through 18.

The Civic Association continues to believe, in light of the data presented, that a two lane alternative is the most feasible (see letter of May 22, 1987 in Appendix C). The Civic Association has provided the following suggestions for future consideration:

> "That Route 37 be restriped as a two lane road for an indefinite study period. The minimum period should be at least four weeks. Prior to, and during this period, traffic counters should be in place at Holbrook Square, South Street, Peach Street, Liberty Street, Route 37 at the Holbrook line and Route 37 at the Plain Street intersection.
>
> "Road signs would be placed to inform traffic of the change in lane numbers. High Police visibility should be maintained to ensure two lane usage."

Appendix A
Minutes of Meetings Held to Discuss Route 37 Study

Minutes of the Route 37 Meeting in Braintree
October 9, 1986

The meeting was held in Braintree to discuss the concerns of Braintree and Holbrook residents concerning Route 37. At issue was the segment of Route 37 linking Plain Street in Braintree and Route 139 in Holbrook. The segment of highway is currently used for 4 lanes of traffic, 2 in each direction.

The Braintree Highlands Civic Association presented information on the existing roadway conditions, neighboring land uses and the impacts widening the road would have on the neighborhood.

The Association reported that 1) The road contains four 9 foot lanes (the association recommends two 12 foot lanes with 6 foot fog lanes); 2) the surrounding land use along the roadway is 83% residential; and 3) widening would require the taking of 6 homes and relocating 20-25 additional homes. The Association indicated that AASHTO standards were not met along this segment and raised the question of liability for safe conditions.

Residents' concerns were predominantly with safety, or the lack of it, under the existing conditions. Several cited having been involved in an accident or knowing people who have been in accidents. Specific examples cited include a vehicle hitting a house, a bicyclist being struck, and pedestrian accidents.

One resident requested comparisons of Route 37 with Route 16 in Medford (2 lanes) and with Route 1A in Salem (2 lanes). He also asked about possible traffic signals along the corridor, citing as an example signals at the Quincy Ave-Newport Ave intersection which serves less traffic.

Another resident suggested use of a 3 lane configuration with the center lane serving directional turns.

Another group of residents cited trucks and buses as being problems in the traffic flow. These concerns included the vehicles being wider than the lanes and buses stopping in the travel lanes.

It was noted by one resident that along the 1.2 mile segment of Route 37 that is four lanes there are 123 driveways and 33 side streets.

Senator Harold summed up the feeling of the meeting as requesting a common sense approach to the traffic needs of the area.

DJF/amf
10-21-86

Attendance Rte. 37 Meeting 10/9/86

Name	Affiliation
Dave M. Dale	Resident
Larry J. Bricks	Resident
Robert A. Hartnett	MDPW, District 6 Traffic
Charles King	Resident
Eric Sliwa	Quincy Patriot Ledger
Sarah Sawyer	Braintree Forum
Bob Kimball	Braintree Highlands Civic Association
Paul Harold	State Senate
St. Syjene	1310 Washington St., Braintree
Thomas Murphy	115 Brewster Ave., Braintree
Cynthia J. Morrissey	59 Logan Drive, Braintree
Lorraine A. Connell	18 Woodedge Ave., Braintree
Edward A. Pentsch	18 Woodedge Ave., Braintree
John J. Murphy	7 Holly Rd., Braintree
Mr. & Mrs. Jack Marshall	1802 WAshington St., Braintree
Stewart M. McKay	16 Weston Ave., Holbrook
Marc Blanchette	356 Hancock St., Braintree
Phyllis Evans	1762 Washington St., Braintree
Joseph Evans	1762 Washington St., Braintree
Marie LaVangie	7 Smith St., Braintree
David A. Randall	16 Vernon St., Braintree
Barbara & Richard Curtin	2026 Washington St., Braintree
Carol Blair	MAPC, Boston
Carol Richmond	MAPC Rep., Braintree
Gerald Richmond	Businessman, Braintree
Stephen Kiser	Resident, 1752 Washington St., Braintree
Rosalie Kiser	Resident, 1752 Washington St., Braintree
Arlene Kiblin	Resident, 1292 Washington St. Braintree
Harry Kiblin	Same
John L. Speredelozzi	Resident, 25 Winthrop Ave, Braintree
John Polio	Police Chief, Braintree
Rep. Emmet Hayes	State Rep., Holbrook
William Marble	Holbrook Fire Chief
John White	Holbrook Police Chief
Bruno J. Pavala	27 Burton Rd., Braintree
Helena French	Resident, 1966 Washington St., Braintree
Dennis French	Same
George C. French, Jr.	Same
Andrew Sagar	15 Standish Ave., Braintree
William Grove	1414 Washington St., Braintree

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Minutes
Rte. 37 Meeting at MAPC - 10:00 AM
9/25/86

This meeting was called to clarify the relationship between two projects on Route 37 in Braintree and to agree on a plan for the study of Route 37 from Plain St. in Braintree south to Holbrook Center (Route 139.)

Attending were:

Dan Fortier	MAPC
Efi Pagitsas	CTPS
Catherine Meyers	MAPC
Carol Blair	MAPC
Robert Patneaude	MDPW/BTP&D
Godwin Agba	Braintree Planning Board
Chuck Sterling	MDPW Traffic
Mike Almada	Town of Braintree, Planner

The meeting began with Chuck Sterling relating the history of the two Route 37 studies in Braintree. The "northern" portion of Route 37 from the Quincy municipal boundary (at Wood Road) southerly to Five Corners will be studied by a private consulting firm hired by the town, with CTPS providing traffic forecasts. The "southern" portion, from the junction of Route 37 with Plain and Hancock Streets to Holbrook Center (at Route 139) will be studied by MAPC and CTPS. Traffic counts have been taken by interns from Representative Bump's office under MAPC's direction.

Representative Bump, last year, requested the study on the southern portion from Plain Street to the Holbrook Line because the 4 lanes in this section are narrow, contain a dangerous curve (in the vicinity between Peach and South Streets) and are traveled too fast through this residential neighborhood. Many accidents occur at high-speeds; many are of the run-off-the-road type at the previously mentioned curve. Speed limits are not enforced, partly because there is no place to pull cars over (no shoulders).

It is understood that local residents want to see 4 lanes reduced to 2 lanes. MDPW can't justify this action because peak hour counts are as high as 1800-2200 vehicles. Chief of Police Polio is on record as opposed to 2 lanes. Residents and Representative Bump called MAPC. Ed Bates and Carol Blair (MAPC) and Chuck Sterling (MDPW) sat with Rep. Bump in June and agreed to draw a work plan. That work plan has been approved by the SSC.

MDPW at one point reviewed the accident history here. A slightly higher than state average rate was observed for night time and wet pavement conditions. There was a fatal accident at Peach Street.

The lanes of Rte 37 are narrow , and cars tend not to feel safe

traveling next to heavy trucks and/or buses. It was also noted that there are no turnouts for buses, which stop in the right lane to pick up and discharge passengers.

Godwin Agba explained that the South Shore Plaza and Flatley Corporation are behind the Granite St. (northern Rt. 37) study. The need is to correct capacity shortfalls. The consultant won't be selected any earlier than mid October. They need to be on board and collecting data before CTPS can assist with this project.

Braintree has very limited buildable land remaining. Although new condos are proposed near Cranberry Pond, large amounts of new development are not expected. Holbrook has much higher development potential.

Any development in Holbrook would probably add trips to Route 37 in Braintree because that is the most direct way to get to the expressway and Route 128.

MDPW is hoping that MAPC and CTPS can provide "creative" solutions to the Route 37 corridor. The ensuing discussion pointed out that:

- Major widening will not prove feasible. No one wants it and the cost would be prohibitive.
- A right-turn-only proposal for egress from Peach Street has been rejected by the town.
- Perhaps there is a creative use for one-way streets to improve safety on Route 37.
- Braintree has formally rejected the concept of developer impact fees just this week (wek of 9/2486).
- Possibly improved lighting and roadway surfaces will reduce accidents.

A timetable was discussed for the study of the Route 37 Efi Pagitas, (CTPS) who will be responsible for traffic forecasts has other work commitments until early November, when she could begin to work on these projects.

It makes sense therefore to take the two studies as separate efforts. This seems appropriate in that traffic forecasts for the southern segment will feed into forecasts for the northern section, where for less new development is anticipated. Representative Bump would like some progress before November and the northern part of the study won't be underway before then. It was agreed that MAPC would hold public meeting in Braintree to hear local concerns and to identify alternative, the public would have the study address. That meeting has been set for October 9 (7:30 pm at the Police Department Training Center in Braintree).

CB/mlm
10/1/86
(B)

Distribution List:

Dan Fortier	MAPC
Efi Pagitsas	CTPS
Catherine Meyers	MAPC
Carol Blair	MAPC
Robert Patneaude	MDPW/BTP&D
Godwin Agba	Braintree Planning Board
Chuck Sterling	MDPW Traffic
Mike Almada	Town of Braintree, Planner

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February 11, 1987

Braintree/Holbrook Route 37 Study
Braintree Town Hall
1 JFK Memorial Drive, Braintree
February 5, 1987, 2:30 P.M.

MINUTES

Attendance

Maura Murphy, Aide to Representative Suzanne Bump
Bill Grove, Braintree Highlands Civic Association
Jack Fehan, Braintree Town Engineer
Thomas Cummings, Holbrook DPW
Carol Richmond, MAPC Representative, Braintree
Saran Gillies, Braintree Board of Selectmen
Efi Pagitsas, CTPS
Robert Patneaude
Robert Hartnett, MDPW District 6
Sgt. Gerard Currie, Braintree Police Department
Eric Schwarz, Quincy Patriot Ledger
Police Chief John White, Holbrook
Safety Officer Wayne Foster, Braintree Police Department
Carol Blair, MAPC
Dan Fortier, MAPC

Others Invited

Representative Robert Hayes
Robert Kimball, Braintree Highlands Civic Association
James Hallahan, Braintree Highway Department
Chief John Polio, Braintree Police Department
Robert Sherman, Braintree Executive Secretary
Frank McGaughey, Chairman, Holbrook Board of Selectmen
Stewart McKay, MAPC Representative, Holbrook
William H. Pritchard, Chairman, Holbrook Planning Board
Senator Paul Harold
Braintree Planning Board
Braintree Board of Selectmen

The meeting started at approximately 2:30 p.m. with the attendees introducing themselves.

rank E. Baxter, President Franklin G. Ching, Vice-President Marjorie A. Davis, Secretary Martha K. Gjesteby, Treasurer

Executive Director: David C. Soule

Carol Blair started the agenda with a brief discussion of the role of MAPC and CTPS. She then described the history of the Route 37 study citing the requests from both Braintree and Holbrook; the early involvement of the Braintree Highlands Civic Association and the Massachusetts Department of Public Works.

Blair described the purpose of the project, as explained in the work program to be to:

1. Identify highway projects that will improve traffic operations and safety in this corridor.

    ° specifically address the concerns of local residents, including four lanes versus two lanes and three lanes.

2. Identify land use growth management techniques which will minimize future development impact on traffic.

Blair identified the important actors in this study process who will make any decisions based on the outcome of the study, as including the Braintree and Holbrook Boards of Selectmen, and the Massachusetts Department of Public Works (MDPW). The MDPW now owns and maintains Route 37 in the study area.

She stated that the study would summarize the advantages and disadvantages of each alternative. She further stated that the purpose of the project is not to recommend one alternative over any other but to support the decision makers in their evaluation of different options.

Blair cited that the progress to date includes the development of the work program, data collection, identification of issues (October 9, 1986 meeting) and some preliminary analysis. She stated that the objectives of this meeting were to ratify the issues, the alternatives to be studied, and the criteria for evaluating these alternatives. Blair then introduced Dan Fortier to lead the discussion.

I. Summarize the Issues

Fortier distributed a handout which listed the issues that were raised at the October 9th meeting and provided a brief description of each issue. These issues on the handout include:

° Roadway Dimensions/Lanes
The specific parameters being the width of the roadway, the number of lanes and the lack of shoulders;

° Traffic Volumes
Specifically the heavy use of the roadway;

° Traffic Speed
The October 9, 1986 meeting identified high traffic speeds and the lack of enforcement of local speed limits as a concern;

- Safety
  A number of people at the October meeting stated the road was too close to the homes, the high number of accidents on the roadway and that they were afraid to use their front yrars due to vehicle speeds; and

- Distance from Road to Homes
  Residents at the October meeting cited occasions when homes were hit or nearly hit by vehicles from Route 37.

The discussion of these issues added the following to the list:

- Turns to and from side streets, specifically safety and delay;

- Sight distance problems, in particular Peach Street;

- Curvature of the roadway; and

- Conflict between neighboring land uses and the function served by Route 37.

II. Discussion to the Alternatives Available for the Corridor

Fortier directed the meeting to the second page of the hand-out which included a list of six alternatives to be studied for the corridor. He briefly described each of the alternatives that were in the handout. The alternatives in the handout are described below:

- No change to current highway conditions;

- Traditional "no-build" analysis involving no changes to the highway;

- Widen Route 37.
  This alternative would involve creating a standard cross-section for a four lane road;

- Restripe Route 37 to Two Lanes
  This alternative would utilize the existing roadway to service two lanes of traffic with shoulders;

- Restripe Route 37 to Three Lanes
  This alternative, raised by citizens at the October 9, 1986 meeting would create a center lane for use as a two-way continuous left-turn lane and two travel lanes;

- Bypass Highway
  This option, highlighted in two previous Town of Braintree Master Plans, would create a new highway bypassing Washington Street; and

- Transportation Systems Management
  Transportation systems management includes actions to improve a roadway without major construction. Management strategies may include intersection signalization, retiming existing signals, carpooling, one-way street pairs, right-turn-only restrictions, transit services, express lanes, intersection widening, pedestrian crossing signals, sidewalks, bus lanes and bus pull-out lanes. TSM can be combined with any of the other alternatives.

The ensuing discussion of alternatives added the following to the list:

- Narrow the Roadway and Reduce to Two Lanes;
- Divide Highway, providing two lanes of traffic and a limited number of Median Breaks; and
- Place Barriers between Roadway and Sidewalks.

The discussion also reflected a consensus that Route 37 is not the right type of corridor for 3 lanes, given the large number of driveways. It was also noted that the bypass proposal had been stopped due to wetlands.

III. Discussion of the Criteria to be Followed in Evaluating Each Alternative

Fortier next focused the discussion on the criteria for evaluating each of the alternatives. These criteria are summarized below:

- Capacity and Delay
  Each location will be evaluated for capacity and delay, estimating the level of congestion in the corridor;
- Safety
  An analysis of accidents rates and type will be reviewed to determine the potential of each alternative to improve safety;
- Secondary Impacts
  A qualitative analysis of potential traffic diversions will be made to determine impacts on parallel routes; and
- Air Quality
  The Boston Region is an air quality non-attainment area, all traffic changes must be reviewed for air quality impacts.

The discussion of these criteria added to the list quality of life, including noies, fumes, the inconvenience of traffic to pedestrians and vehicles wanting to cross the traffic stream, and the anxiety to residents due to unsafe conditions.

Blair summarized the discussion and stressed the importance of this process where all actors agree on the essentials of the study. She indicated that those who could not attend will receive these minutes and should be encouraged to respond with any comments. If all of the actors in this situation are involved, we can be sure that no options are overlooked.

DF/lpb
2/12/87

Issues

Roadway Dimensions/Lanes

Traffic Volumes

Traffic Speed

Safety

Distance from Road to Homes

Alternatives

- No Change to Current Highway Conditions
- Widen Route 37
- Restripe Route 37 to Two Lanes
- Restripe Route 37 to Three Lanes
- Bypass Highway
- Transportation Systems Management

Transportation Systems Management

- Intersection Signalization
- Carpooling
- One-way Street Pairs
- Right-Turn-Only Restrictions
- Transit Services
- Express Lanes
- Intersection Widening
- Pedestrian Crossing Signals
- Sidewalks
- Bus Lanes
- Bus Pull-Out Lanes

Criteria For Evaluating Alternatives

- Capacity and Delay
- Safety
- Secondary Impacts
- Air Quality

Metropolitan Area Planning Council

110 Tremont Street Boston, Massachusetts 02108 (617)-451-2770

Serving 101 Cities & Towns in Metropolitan Boston

Braintree/Holbrook Route 37 Task Force
Braintree Town Hall
1 JFK Memorial Drive, Braintree
April 30, 1987, 2:30 PM

MINUTES

Attendance

Efi Pagitsas, CTPS
Dan Fortier, MAPC
Carol Richmond, MAPC Rep., Braintree
Joan Oates, Senator Harold's Office
Ed Bates, MAPC
Wayne Foster, Braintree Police Department
Paulette McLarney, Holbrook Sun
Jim Roberts, MAPC
Stephen Kiser, Braintree Resident
Thomas Cummings, Holbrook Public Works Supervisor
Ed Bromage, CTPS
Robert Patneaude, MDPW-Planning
Robert A. Hartnett, MDPW-District 6-Traffic Engineering
William Grove, Braintree Highlands Civic Association
Lisa Lynch, Representative Bump's Office
Robert Brien, Braintree Planning Department
Jack Fehan, Braintree Town Engineer
Allan Fitzsimmon, Planning Board

The meeting started at approximately 2:30 pm with the attendees introducing themselves.

I. Overview of Study

Fortier presented the Task Force with an overview of the history of the Route 37 study including the nature of the request, how the data was gathered, locations for data collection and the discussions and agreements from the October 9, 1986 and February 5, 1987 meetings. He then described the objective of this meeting as being the review of the analysis and to solicit additional input.

II. Presentation on the Analysis of the Alternatives Available for the Corridor

rank E. Baxter, President Franklin G. Ching, Vice-President Marjorie A. Davis, Secretary Martha K. Gjesteby, Treasurer

Executive Director: David C. Soule

A. Overview of Methodlogy

Fortier reviewed the alternatives and the criteria for evaluating the alternatives that had been agreed upon at the February 5, 1987 meeting. He described the alternatives as including:

- No Change;
- Widen;
- Restripe to Two Lanes;
- Restripe to Three Lanes;
- Bypass; and
- Narrow the Highway

He also described three options that MAPC is referring to as "Add Ons." These include:

- Transportation Systems Management;
- Median Barrier; and
- Guard rails

Fortier described the criteria as including:

- Capacity and Delay;
- Safety
- Traffic Diversions (formerly Secondary Impacts);
- Environmental Quality (formerly Air Quality);
- Quality of Life; and
- Feasibility

B. Review of Capacity Analysis

Pagitsas distributed a table describing the Levels of Service, Speed and Emissions associated with existing conditions, widening the highway to four 12 foot lanes and narrowing the highway to two 12 foot lanes (Attachment 1). She reviewed for the Task Force the potential outcome of implementing a particular alternative on these measures. She pointed out the improvement in conditions if the highway were to be widened and the deterioration of conditions associated with constraining traffic to two lanes.

C. Review of Advantages and Disadvantages Associated with each Alternative

Fortier distributed two sets of tables to the Task Force. The first was a summary of the impacts of the alternatives (Attachment 2), the second a set of more detailed discussions of these impacts (Attachment 3). He encouraged the Task Force to review and mark-up these tables and return them with comments to MAPC.

Fortier gave a general presentation of the most significant concerns related to each alternative referring to the handouts as necessary to emphasize a particular point. He focused attention on the No Change, Two Lane and Transportation Systems Management

alternatives, while giving a more general presentation of the other alternatives. Fortier presented how each alternative addressed the capacity, safety, traffic diversion, environmental quality, quality of life and feasibility criteria.

III. Discussion of the Analysis of the Alternatives Available for the Corridor

Upon the completion of the presentations Fortier opened the meeting up to discussion of the analysis. Comments included:

- Limited congestion problems during the winter months when the road operated as a two lane facility due to snow on the pavement;
- The issue of emergency vehicle response time was raised, by the Braintree Planner but the Braintree Engineer and Police Department felt that this was not an important item because speed was the problem, not congestion;
- Traffic diversion routes that may occur were identified as including Ivory Street, Grove Street and Liberty Street;
- Traffic growth due to new developments in the area and its resulting increase congestion was discussed. The Task Force was told a section of the study will deal with growth management strategies;
- A query was made about why should this facility be four lanes in Braintree and only two lanes in Holbrook. Congestion currently occurs on the Holbrook section of Rte 37.
- It was suggested that Route 37 be striped in order to guide traffic on lane use;
- A question was raised regarding the type of cross-sections used in the analysis. Pagitsas explained the cross-sections used for the analysis of the alternatives.
- It was suggested that the report include the financial feasibility of widening the roadway;
- The highway bridge over the B&M railroad was mentioned as not providing safe sight distance for signalization of Peach Street, this location may need some form of early warning signal to alert approaching vehicles of the signal Phase at the intersection;
- MDPW assured the Task Force that widening the highway has not been ruled out as an alternative; and
- MDPW suggested that the report include a recommended action for the corridor.

Meeting adjourned at 3:50 pm.

DF/mlm
5/14/87
(D)

Metropolitan Area Planning Council

110 Tremont Street Boston, Massachusetts 02108 (617)-451-2770

Serving 101 Cities & Towns in Metropolitan Boston

Route 37 Meeting
July 1, 1987, 9:00 A.M.
MAPC Conference Room

MINUTES

Attending

Representative Suzanne Bump
Robert Patneaude, MDPW
Ed Bromage, CTPS
Efi Pagitsas, CTPS
David C. Soule, MAPC
Ed Bates, MAPC
Carol Blair, MAPC
Dan Fortier, MAPC

A meeting was held at the Metropolitan Area Planning Council on July 1, 1987 to discuss the status of the Route 37 study and the future direction of this project. The meeting was called after MAPC received letters from Representative Suzanne Bump, the Braintree Highland's Civic Association, the Braintree Board of Selectmen and unwritten comments from Holbrook and from MDPW in response to MAPC and CTPS presentations to the Route 37 Task Force Meeting of April 30, 1987.

Carol Blair and Dan Fortier provided background information to ensure that everyone present was informed as to the status of the study and how it has developed and progressed.

Representative Bump explained that the community sentiment was that quality of life and safety would be best served by a lane reduction. The feeling of the community, she stated, was that a lane reduction would not have the negative impacts that have been anticipated in the work presented to date. Based upon this feeling, the community, the Civic Association and her office requested a test period of two lanes for Route 37.

Bob Patneaude explained the work yet to be completed on the project with regard to trip diversions. He felt that the community should wait until all the work in the Route 37 study is complete before making decisions; even on a demonstration. He indicated that MDPW has a policy against diverting traffic to local streets and that changing Route 37 to two lanes might have just that effect.

The timeframe for completing this work would depend on the state's ability to complete the traffic counts. The timeframe would be for a draft report to be ready 6-8 weeks after the completion of the traffic counting. Tentative completion of the draft report would be in late October.

Frank E. Baxter, President Franklin G. Ching, Vice-President Marjorie A. Davis, Secretary Martha K. Gjesteby, Treasurer

Executive Director: David C. Soule

The trip diversion modeling based upon the additional traffic counts will include four 10 foot lanes, two 12 foot lanes with 8 foot shoulders, and four 12 foot lanes. Safety consideration will also be addressed for two 12 foot lanes with passing zones.

Representative Bump also asked about the Transportation Systems Management proposals that were discussed at the April meeting. She was assured that these would be included in the recommendations.

DF/mlm
7/8/87
(A)

Appendix B
Development Impact Standards

B-1

Zoning Bylaw Provisions for Site Plan Review*

IV.I.6. Development Impact Standards

The following standards shall be used in evaluating projected impacts of proposed developments. "Required" standards must be met by all developments subject to this section. "Recommended" standards are set forth as guidelines to both the Planning Board and applicants, and are not intended to be inflexible requirements nor to discourage creativity and innovation.

(a) Traffic Impact Standards

(1) Required:

The "level of service" (LOS) of all impacted intersections and streets shall be adequate following project development, or the total value of off-site traffic improvements required or approved bythe Planning Board as a condition of approval shall be equal to three per cent (3%) of the total development cost of the proposed project. For purposes of this standard:

(i) "level of service" (LOS) shall be determined according to criteria set forth by the Transportation Research Board of the National Research Council;

(ii) "impacted means located within 1000 feet of the closest boundary of the project site and projected to receive at least five per cent (5%) of the anticipated average daily peak hour traffic generated by the proposed development.

(iii) "adequate" shall mean a level of service of "B" or better for rural, scenic and residential streets and for all new streets and intersections to be created in connection with the project; and "D" or better for all other streets and intersections; and

(iv) "total development cost" shall mean the total of the cost or value of land and all development-related improvements, and shall be determined on the basis of

standard building or construction costs, such as published in the Engineering News Record or other source acceptable to the Planning Board, for the relevant type of structure and use.

* source: Town of Framingham Site Plan Review (Adopted by Special Town Meeting - June 19, 1985)

B-2

(2) Recommended:

The proposed site plan shall minimize points of traffic conflict, both pedestrian and vehicular. The following guidelines shall be used to achieve this standard:

(i) Entrance and exit driveways shall be so located and designed as to achieve maximum practicable distance from existing and proposed access connections from adjacent properties.

(ii) Where possible, driveways shall be located opposite similar driveways.

(iii) Sharing of access driveways by adjoining properties and uses is encouraged.

(iv) Left-hand turns and other turning movements shall be minimized.

(v) Driveways shall be so located and designed as to discourage the routing of vehicular traffic to and through residential streets.

(vi) Pedestrian and bicycle circulation shall be separated from motor vehicle circulation as far as practicable.

IV.I.8. Conditions, Limitations and Safeguards

In granting approval of an application the planning Board may impose conditions, limitations and safeguards which shall be in writing and shall be a part of such approval. Such conditions may include, among other matters and subjects:

(a) Controls on the location and type of access to the site;

(b) Controls on the number of vehicles that arrive or depart during the morning and/or evening peak hours (including controls on the maximum number of vehicles which may use the off-street parking areas during said periods);

(c) Requirements for off-site improvements to improve the capacity and safety of roads, intersections, pedestrian ways, water, sewer, drainage, and other public facilities which are likely to be affected by the proposed development;

(d) Requirements for donation and/or dedication of land for right-of-way to provide for future roadway and/or intersection widenings or improvements;

(e) Requirements for securing the performance of all proposed work, including proposed off-site improvements, by either or both of the following methods: (1) a performance bond, a deposit of money, negotiable securities, letter of credit, or bank passbook in an amount determined by the Planning Board to be sufficient to cover the cost of all or any part of the improvements required as conditions of approval; (2) a covenant running with the land, executed and duly recorded by the owner of record, whereby the required improvements shall be completed before the property may be conveyed by other than a mortgage deed.

(f) Conditions to minimize off-site impacts on traffic and environmental quality during construction.

Appendix C
Correspondence

Braintree Highlands
Civic Association

Route 37

October 9, 1986

Metropolitan Area Planning
Council
110 Tremont Street
Boston, MA 02108

Dear Sirs:

This Committee was formed by the Braintree Highlands Civic Association to address concerns regarding the safety of Route 37.

The 2 major concerns are: 1) excessive speed, which we are pursuing through the Police Department, and 2) inadequacies of the road lay-out (road width).

Using the enclosed data, the conclusion has been drawn that this road does not meet current minimum standards for a 4-lane highway containing the amount and mixture of vehicular traffic through a residential area.

Due to the proximity of many homes to the traveling lanes of the roadway, the widening of this roadway is not a feasible alternative. The minimal increase in convenience to the driving public cannot be balanced by the displacement of many homes.

In the interest of safety, the Braintree Highlands Civic Association makes the following recommendations:

1. Removal of current fog lines and placement of new fog lines 6 feet from the curbing.

2. Designation of 12 foot traveling lanes, 1 northbound and 1 southbound.

3. Change substandard median width from 15 inches to 4 feet.

4. Signs along the roadway informing the public of single-lane usage.

In addition, there has been discussion regarding designated areas for left-hand turns in areas of high usage. Feasibility and necessity of these should be investigated.

Your prompt attention to the above matters is urged!

Yours truly,

William J. Grove

William J. Grove
Chairman, Route 37 Study Committee
Braintree Highlands Civic
Association

1414 Washington Street
Braintree, MA 02184

WJG;vmg
Encs.

"Whose responsibility is it to see that maximum safety is incorporated into our motor vehicle transportation system? On this, the sub-committee is adamant. It is the responsibility of Government and specifically those agencies that, by law, have been given that mandate. This responsibility begins with the Congress and flows through the Department of Transportation, its Federal Highway Administration, the State Highway Department and safety agencies, and the street and highway unit of counties, townships, cities and towns. There is no retreating from this mandate, either in letter or in spirit."

The House Committee on Public Works

ROAD DATA

Length	- 1.2 Miles (Plain St/Holbrook)	
Width	- 40 Feet	
Lane Width	- 9 Feet	
Fog Lines	- 1.5 Feet from Curb	
Center Line	- 1.25 Feet Wide	
Area Type	- Residential (83%)	
Feeder Roads	- North:	Three 2-lane roads (Signal controlled)
	South:	Route 37, 2-lane
	Main Body:	Two 2-lane Roads, Thirty-two 1-lane roads

Evaluation Information

Design Vehicle Dimensions [1]

Passenger Car - 7 feet wide

Bus - 8.5 feet wide*

Semitrailer - 8.5 feet wide

Driver Error

High accident locations coincide with areas that contain too much data to analyze in a given period of time. [2]

Access Control

"The type of street or highway to be built should be coordinated with the local land use plan to ensure the desired degree of access." [3]

Lane Width

"No feature of a highway has a greater influence on the safety and comfort of driving than the width and condition of the surface."

"Although lane widths of 12 ft. are desi able on both rural and urban facilities, there are circumstances that necessitate the use of lanes less than 12 ft. wide. In urban areas where right-of-way and existing development become stringent controls the use of 11 ft. lanes is acceptable. Ten-ft. lanes are acceptable

* New M.B.T.A. buses are 9 ft. wide.

on low-speed facilities. Under unusual and severe constraints, 9 ft. lanes can be used in residential areas where traffic volumes are low."[4]

Width of Roadway (Collector)

"The width of an urban collector street should be planned as the sum of the ultimate lanes for moving traffic and parking, including median width where appropriate. Street lanes for moving traffic should range in width from 10 to 12 ft. in industrial areas, lanes should be 12 ft wide. Where available or attainable width of right-of-way imposes severe limitations, lanes 10 ft wide can be used in residential areas and lanes 11 ft wide in industrial areas. Added turning lanes at intersections, where used, should range in width from 10 to 12 ft, depending on the percentages of trucks."[5]

Lane Widths (Arterial)

"Lane widths may vary from 10 ft to 12 ft. The 10-ft widths are used in highly restricted areas having little or no truck traffic. The 11-ft lanes are used quite extensively for urban arterial street designs. The 12-ft lane widths are most desirable and are generally used on all higher speed, free-flowing, principal arterials."[6]

REFERENCES

1. American Association of State Highway and Transportation Officials: Policy on geometric design of highways and streets. pp. 21, 1984.

2. American Association of State Highway and Transportation Officials: Policy on geometric design of highways and streets. pp. 45-46, 1984.

3. American Association of State Highway and Transportation Officials: Policy on geometric design of highways and streets. pp. 110, 1984.

4. American Association of State Highway and Transportation Officials: Policy on geometric design of highways and streets. pp. 360, 1984.

5. American Association of State Highway and Transportation Officials: Policy on geometric design of highways and streets. pp. 523, 1984.

6. American Association of State Highway and Transportation Officials: Policy on geometric design of highways and streets. pp. 569, 1984.

JOHN F. FEHAN
TOWN ENGINEER

TELEPHONE
848-1870

THE TOWN OF BRAINTREE
OFFICE OF THE TOWN ENGINEER
ONE JOHN FITZGERALD KENNEDY MEMORIAL DRIVE
BRAINTREE, MASSACHUSETTS 02184

January 16, 1987

Carol W. Blair
Chief Transportation Planner
Metropolitan Area Planning Council
110 Tremont Street
Boston, MA 02108

Dear Ms. Blair:

We were recently requested by the Braintree Highlands Civic Association to intercede on their behalf in their efforts to improve traffic conditions on Route 37 in Braintree Highlands. Accordingly, I wish to inform you that I recommend the adoption of the recommendations contained in the letter of October 9, 1986 to your office from William J. Grove, Chairman of the Association.

Specifically, I feel that Route 37 as presently constructed is much too narrow for a four-lane roadway. Since any widening of the roadway is obviously a very expensive and time-consuming project, the only short-term solution to the traffic situation is the restriping of the roadway to a configuration that has one lane in each direction and a substantial median barrier.

We would have contacted you earlier had we been informed of the October 9 meeting. However, we will be present at the up-coming meeting on January 22 and would appreciate receiving notices of any future meetings.

Thank you very much for your cooperation.

Very truly yours,

John F. Fehan

John F. Fehan, P.E.
Town Engineer

ae

cc: William J. Grove

Office of the Planning Board

Holbrook, Massachusetts 02343 767-4312

March 16, 1987

Ms. Carol Blair
Metropolitan Area Planning Council
110 Tremont Street
Boston, Massachusetts 02108

Dear Carol:

With regard to the Minutes of the February 5, 1987 meeting of the Rt. 37 study in Braintree and Holbrook, the Holbrook Planning Board wishes to add some additional comments.

As the number of residential units serviced by Rt. 37 increases, due to new construction, the secondary roads in this area will be forced to handle more and more vehicular traffic. Reducing the number of lanes in service will reduce the speed and capacity of the road. It will also increase the lines which make entry and exit from abutting driveways more difficult and dangerous. It will not necessarily result in slower travel at times when the road is unobstructed. It will increase polution from backed-up traffic and the sense of frustrations from the drivers on the road. The present two lanes in each direction handles traffic situations such as cars waiting to turn left or cars parked on the right more flexibly than would be the result with fewer lanes.

If any section of the roadway can be feasibly widened and/or straightened in any part of the area, it will improve the road's ability to handle the loads that it presently has and will, in the future, have.

Very truly yours,

THE HOLBROOK PLANNING BOARD

William H. Pritchard

William H. Pritchard, Chairman

WHP:sd

The Commonwealth of Massachusetts
HOUSE OF REPRESENTATIVES
STATE HOUSE, BOSTON 02133

SUZANNE M. BUMP
REPRESENTATIVE
5TH NORFOLK DISTRICT
ROOM 443, STATE HOUSE
TEL. 722-2460

May 28, 1987

Committees on
Transportation
Commerce and Labor
Housing and Urban Development

LISA LYNCH
LEGISLATIVE AIDE

Carol Blair
Metropolitan Area Planning Council
110 Tremont Street
Boston, MA 02108

Dear Carol:

Thank you for your continuing efforts to assist us with the traffic and safety problems on Route 37, especially in Braintree. I regret my inability to have been present at the most recent meeting. I have reviewed the report you prepared, and I appreciate this opportunity to comment on it.

Of the six "Alternatives," I would recommend against further consideration of No Change, Widening to Four Lanes, Restriping to Three Lanes, and Narrowing to Two Lanes. Of the three "Add ons," I would recommend against Center Line Median or Barrier. This leaves Transportation Systems Management.

With regard to reduction to two lanes, I believe that the projected negative impacts will not be realized to the extent indicated. I agree that especially at peak times traffic will be slowed. I regard this as a benefit. However, based on experience, I do not believe that the change will produce the degree of congestion and LOS or environmental impacts projected.

Since the best way to accurately guage the impact is through actual experience, may I suggest that your report indicate that a trial period be considered for this alternative. A period extending for at least two month should provide us with the information we need.

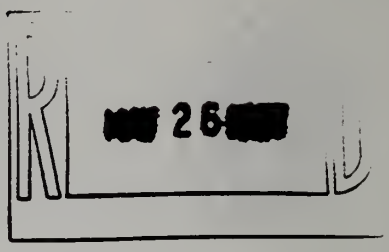
As to the remaining "Add on," I recommend highly our further pursuit of specific locations. I will assist in this in any way I can. As I did last year, I can make available summer interns (this year, two) to do any leg work.

Thanks again for your assistance. I will be calling in the near future to see where we go from here.

Sincerely,

SUZANNE M. BUMP
State Representative

cc Bill Grove



1414 Washington Street
Braintree, MA 02184
May 22, 1987

Ms. Carol Blair
Metropolitan Area Planning
Council
110 Tremont Street
Boston, MA 02108

Dear Carol:

On May 17, 1987, the Braintree Highlands Civic Association Route 37 Study Committee met to review the Route 37 Study, Technical Draft, compiled by your group. It was the concensus of the Study Committee that the safety of the residents, pedestrians and drivers is not being given proper consideration.

While traffic management is a start (lights at South and Peach Streets are needed for any configuration of the road), it was felt that more was required. The alternative of widening this section of the road would be a detriment to safety, destroy the existing neighborhoods and most probably compound the bottlenecks created by the existing change in the number of lanes.

The restriping of the road to two lanes was felt to be the most feasible. The Committee felt that your predictions with regard to delays, environmental quality and increased congestion were not accurate. No consideration was given for time shift and any diversions that might occur. Operation as a two lane road would be the same as Route 37 operates many times during the winter. Under Safety Impacts, shoulders used as travel lanes are listed as a disadvantage. This should be offset by increased opportunity of enforcement listed under Quality of Life. Also under Safety Impacts, reduction in variations of vehicle speeds is listed as an advantage. Less variations in speed relate to fewer speed related accidents. This was not listed as an advantage.

In an attempt to resolve how the road should be addressed, the Braintree Highlands Civic Association Route 37 Study Committee is forwarding these suggestions:

> That Route 37 be restriped as a two lane road for an indefinite study period. The minimum period should

be at least four weeks. Prior to, and during this period, traffic counters should be in place at Holbrook Square, South Street, Peach Street, Liberty Street, Route 37 at the Holbrook line, and Route 37 at the Plain Street intersection.

Road signs would be placed to inform traffic of the change in lane numbers. High Police visibility should be maintained to ensure two lane usage.

Under these conditions all aspects of Route 37, except the accident rate, and adjacent streets can be properly evaluated. Accident rate data would require a longer trial period.

If this study is not performed, the process that we have been going through for the past one and one-half years will undoubtedly be repeated at some future date, and the MAPC will have lost the opportunity to collect valuable information.

If I can be of any assistance, please do not hesitate to contact me.

Sincerely,

William J. Grove

William J. Grove
Braintree Highlands Civic
Association
Route 37 Study Committee

CC: Braintree Board of Selectmen
Senator Paul Harrold
Representative Suzanne Bump

THE
TOWN OF
BRAINTREE

OFFICE OF SELECTMEN

TELEPHONE
848-1870

ONE JOHN FITZGERALD KENNEDY MEMORIAL DRIVE
BRAINTREE, MASSACHUSETTS 02184

RECEIVED
JUN 11 1987

June 10, 1987

Metropolitan Area Planning Council
110 Tremont Street
Boston, Massachusetts 02108

Dear Members:

The Board of Selectmen during its regular meeting Monday evening, reviewed the Summary of Impacts for Six Alternatives prepared by your Planning Council seeking possible solutions to traffic problems on Route 37, Braintree.

The Board voted unanimously to support the concept of restriping to two lanes and ask your Council to finalize these plans.

At this time, the Selectmen wish to extend their sincere appreciation for your valued assistance in this program.

Very truly yours,

Robert R. Sherman
Executive Secretary/Administrator

RRS:egd

Copy to Bill Grove, Chairman, Route 37 Committee

Town of Braintree, Massachusetts

Police Department

Telephone 843-1212

CHIEF JOHN V. POLIO

July 27, 1987

Carol Blair, Transportation Program Manager
Metropolitan Area Planning Council
110 Tremont Street
Boston, Massachusetts 02108

Dear Ms. Blair:

Needless to say, traffic on Washington Street in Braintree Highlands has been the subject of discussion for the last half a century. This is as it should be since there is a lot of room for improvement.

Several alternatives have been discussed, and I still believe that the physical changes necessary to accommodate four lanes would be the best longterm solution. Although that approach has its drawbacks (e.g. landtakings, higher cost, attraction of additional traffic, etc.), it is the only option that provides substantial improvement for the future.

I know my opinion does not "set too well" with many. Be that as it may, I stated at the meeting held at the Braintree Police Training Center almost one year ago that I would cooperate and do all in my power to make the majority's choice workable for a trial period. I would utilize all tools available to me to monitor the situation to give it a fair trial. As I see it, the majority's choice is Alternative Three whereby that portion of Route 37 from Plain and Hancock Streets to the Holbrook line is restriped to two lanes, with an adequate shoulder for breakdowns.

In light of all that has been said and done, I believe it behooves us to implement a trial period of two months commencing in September 1987. This timeframe would give us the truest picture of just how it will work. I believe we've talked enough. This is one skeptic that recommends that we give it a try and hope it works.

Respectfully submitted,

John V. Polio
Police Chief

JVP/vm